Volume 94 Number 13

STEEL

Production • Processing • Distribution • Use

The Week in Perspective

NRA APPROACHES THE CROSSROADS as the political and industrial air becomes bluish with a fog of dissension over the Wagner labor bill, of labor heated to the critical temperature by organizers, of the federal trade commission's blast at the basing point system of the steel code and of a temporary dislocation of spring business recovery. p. 10

BASING POINT SYSTEM of steel prices, despite the trade commission's charge that it is unfairly discriminatory, often works to the important advantage of a consumer in regard to delivered cost of material. p. 19

BULGE IN RETAIL SALES of automobiles is confidently expected by builders who consequently have not restricted material specifications to any great degree. p. 15

PLATE AND SHAPE AWARDS in the San Francisco district the past week were the largest so far this year. p. 74

LABOR UNION in one Detroit plant claims 10,000 new members whose initiation fees and dues in one month net the union $25,000. Who gets it? p. 14

STEEL MILL LABOR, according to a private survey made by STEEL, is considerably less than 50 per cent organized . . . . special inducements are being offered by organizers . . . . conditions vary from plant to plant . . . . future trend is unpredictable. p. 13

FOUR HUGE TRAVELING CRANES, each of 300-ton capacity, have been bought by the government for installation in the Boulder dam power house. p. 28

A HEAVY ROTARY DRYER, built for use in a chemical process industry, required complete protection against corrosion. Some of the largest plates of stainless-clad steel ever rolled were used in construction of the 35-foot cylinder, 6 feet in diameter. p. 32

A THOUGHT FOR THE WEEK: If the administration would leave the same 52 cards in the deck long enough for industry to get used to them, the new deal might mean more than it does today. p. 22

WELDED STEEL BURIAL VAULTS, chemically rustproofed and finished in porcelain enamel or a hard baked varnish, have been designed to repel for ages the attacks of soil moisture and corrosive agents. p. 25

OPEN-HEARTH OPERATIONS the past wee veered downward 1 point to 49 per c nt, encou tering plenty of resistance to an precipita decline. p.

GASKETS, though you may act know it potential outlets for fair tonna ges of sh in certain forms.

CORROSION-RESISTING CONTAINERS, holding 55 gallons, for sh pment of soft drink syrup, are of 16-gage 18- chrome-nickel steel, with flash welded side sea m. p. 36

WIRE DRAWING P LOCKS have undergone considerable refi ement since their early days. Bundles have i creased in weight in some cases to as high as 9 0 pounds. Blocks are now largely driven by i dividual motors instead of being geared to a c mmon bench shaft. p. 50

RIGHT AND L EFT-HAND THREADS are distinguished read ly on nuts made of recently-introduced cold drawn hexagon bars into which the letter R or L is rolled. p. 35

SUDDEN BREAKAGE of a 10-inch driveshaft operating a San Francisco cable railway tied traffic in a knot. Thermit welding of the break restored order in about a day and a half. p. 30

RUSSIAN BLAST FURNACES are being fitted with improved filling equipment by American engineers, substantially increasing output. p. 48

Steel Girds Against Wagner Bill; Labor Is Chief Concern

AS IRON and steel at a series of regional meetings last week began crusading against the Wagner labor bill it encountered flank attacks from the federal trade commission in a critical analysis of the steel code and from the department of justice in a suit against the Weirton Steel Co. involving representation of employes.

Meanwhile, steelworks labor was kept in a ferment by organizers for the American Federation of Labor and affiliated unions, and both management and labor were anxiously following negotiations at Washington calculated to avert a strike in the automobile industry, attempting to gage the temper of the administration and the public.

These dislocations emanating almost entirely from the operation of NRA, there was a growing disposition in the industry to weigh the advantages and disadvantages of the steel code which, incidentally, expires May 31. In fact, principally because it has set labor against management, the administration's recovery program generally was on the defensive last week.

Critical of Price Policy

Aimed primarily at NRA and blaming it for alleged unfair and discriminatory practices sanctioned by the steel code, the trade commission nevertheless was hitting at the steel industry. (See pp. 18, 19, 20). The President, it was disclosed at the White House, is following the open-price matter closely and is inclined to be a little critical—an attitude that may be reflected when codes come up for renewal.

Unlike the automotive industry, no direct demands have been made upon steel by labor even though no action has been taken on the President's suggestion to industry generally that it shorten hours and increase wages. However, steel labor is in a sensitive balance (see pp. 13, 76), being less than 50 per cent unionized and yet in the state where outside events may steer it safely to the right or swing it violently to the left.

Unquestionably, NRA is at the crossroads. Its encouragement to labor and consequent unsettlement penetrating deeply even into retail sales have thrown spring business recovery off its stride. Steel operations last week surrendered another point to 49 per cent, but there is a strong undercurrent that industry's vehement protests against the Wagner bill will lead the administration at Washington, abnormally sensitive to public sentiment, into more conservative channels.

Wagner Bill

TUESDAY, April 3, the iron and steel industry will appear before the senate labor committee to register its personal protest against the Wagner bill, creating a permanent national labor board and virtually outlawing company unions. Arthur H. Young, vice president of United States Steel Corp. in charge of industrial relations, is expected to lead the attack.

Last week operating executives of principal steel producers in the New York, Chicago, Pittsburgh, Cleveland, and Birmingham districts staged regional meetings, with attendance ranging from 40 upward, and adopted resolutions denouncing the Wagner bill most vigorously.

By last Saturday there was scarcely an important executive in sales as well as producing departments who had not telegraphed his alarm to his senator.

Arthur H. Young

Vice president in charge of industrial relations of the United States Steel Corp., he will be spokesman for the steel industry April 3 in a formal protest against the Wagner labor bill

Typical of the protests was the charge of a New York group that the Wagner and Connery bills, the latter putting a 30-hour maximum on the work week," hark back to the old discredited idea that interests of employes and employers are antagonistic. Such legislation would array class against class, foment general discord, destroy existing harmonious relations and block progress toward recovery."

The country over, employers' associations also were filing their objections to the Wagner bill.

"Drastic and revolutionary in its provisions and beyond all previous efforts to bring about by law a closed shop in American industry" was the indictment of the National Erectors' association, New York.

In its analysis, the National Association of Manufacturers emphasized the premium placed upon strikes and the possibility that a person seeking employment might be required to join a union.

Weirton Case

TIMED to coincide with negotiations to quell the automobile strike, the department of justice last week belatedly filed suit against the Weirton Steel Co.

An injunction to restrain the Weirton company from violating the collective bargaining section of the recovery act was filed Tuesday in Delaware, the state in which Weirton is incorporated.

Although ostensibly wielding the heavy hand of the government against Weirton, the court action did not satisfy union agitators, who immediately contended that "even if the courts do grant the injunction, E. T. Weir, chairman, will not be forced actually to deal with the union."

Specifically, the suit is the outcome of the election of employe representatives last Dec. 15, the election in turn growing out of negotiations with the national labor board dating back to September. The election greatly favored the employe representation plan; union agitators charged the election was not representative.

The bill of complaint charges Weirton with the following violations of the steel code::

1.—The denial of the right of its employes to bargain collectively through representatives of their own choosing.

2.—The denial of their right of self-organization.

3—The interference by the Weirton Steel Co. with the designation of representatives of its employes.

4—The interference by the Weirton Steel Co. with the self-organization and concerted activities of its employes.

5—The exercise of restraint and coer-

cion on the part of the Weirton Steel Co. with regard to the exercise of the rights of its employes conferred by Section 7 (A) of the national industrial recovery act.

6—The imposition by the Weirton Steel Co. of the requirement that its employes, as a condition of employment, join its company dominated union.

7—The imposition of the condition by the Weirton Steel Co. that its employes refrain from joining or affiliating with the union of their own choice.

Mr. Weir, who at the outset said "we are living up to every principle of NRA; the men don't know what all the fuss is about and I don't either," refused to comment on the suit.

Labor

NATIONAL labor board has ordered an election by employes at the Thomas furnace of the Republic Steel Corp., at Thomas, Ala. A local of the International Union of Mine, Mill and Smelter Workers has been organized at Thomas and there is a conflict with the employe representation plan set up in June, 1933.

The labor board has recommended a similar election at the Raimund mine of the Republic Steel Corp. in Alabama, but admits it has no jurisdiction since the mine is not being operated under a code.

¶A petition for an election under the national labor board at the Duquesne Works of the Carnegie Steel Co. was filed last week by a delegation of employes headed by a representative of the Amalgamated Association of Iron, Steel and Tin Workers.

¶Employes of the Edward G. Budd Mfg. Co., Philadelphia, boycotted the election held March 20 on the question "do you favor representation by the United Automobile Workers federal union of the American Federation of Labor," in effect sustaining the position of the company that employes preferred the company plan.

In announcing the election, NRA Administrator Johnson said, "I think that Mr. Budd has acted in complete good faith. . . . It is indicated to me that an employe representation plan is desired by a majority of the men." The election seems to sustain this viewpoint.

NRA

PRESIDENT ROOSEVELT on March 20 signed the basic code of the machinery and allied products industries, to be effective March 28. Other codes signed are metal lath, effective March 26; clay machinery, effective April 2; tool and implement manfacturing industry, effective March 25; and hack saw blade manufacturing industry, effective March 27.

¶Code hearing postponed: Safety razor and safety razor blade manufacturing, from March 26 to April 2.

Institute

AMERICAN IRON AND STEEL INSTITUTE has promulgated following commercial resolutions:

No. 49, effective March 22, in regard to stamping of bills of lading and shipping orders to prevent reconsignment of products without the consent of the code member selling them.

No. 50, amending No. 29, revising provisions for the discount for early payment on invoices of products sold to railroads.

No. 51, interpreting sections of the steel code relating to plates, shapes or bars intended for fabrication for an identified structure.

No. 52, declaring that switching charges prescribed in resolution No. 20 shall apply per gross ton only if the published base prices for the product is on a gross ton basis; otherwise switching charges shall apply per net ton.

No. 53, with regard to sales of products by code members to affiliated companies of other code members.

No. 54, relating to computation of freight charges and allowances under resolutions No. 29 and 38.

No. 33, amended as of March 15 extending the final date for shipment of railroad material financed by the government to Aug. 31.

No. 34, amended as of March 15 relating to products required by the government for a relief project.

No. 42, amended Feb. 2 with regard to deductions from base prices of pipe and other tubular products.

No. 45, amended as of March 15 postponing the final shipment date of track material purchased with government funds to Aug. 31.

¶Light rails (60 pounds or less per yard) become $32 a gross ton, Pittsburgh, April 2. Tinned high carbon curtain spring wire became $11 per 100 pounds at Cleveland, March 16.

¶A producer of stainless steel seamless tubing has formally filed prices

His Pet

Cartoon courtesy of *Chicago Daily Tribune*

which have been effective since Jan. 30.

¶A maker of butt weld steel pipe, standard weight, for structural purposes only has filed basing discounts at Pittsburgh and Lorain, O., effective April 2.

¶Bringing his quotations in line with those prevailing generally for some time, one wire producer—and the last—has filed prices at certain southern basing points on a number of wire products, effective March 29, as follows: Annealed fence wire, 2.65c, Houston and Galveston, Tex., and 2.75c, New Orleans; galvanized fence wire, 3.00c, Houston and Galveston, and 3.10c, New Orleans; wire nails, 2.75c, New Orleans; polished fence staples, 3.35c, Houston and Galveston, and 3.45c, New Orleans; galvanized fence staples, 3.60c, Houston and Galveston, and 3.70c, New Orleans; galvanized netting staples, 4.75c, Houston and Galveston, and 4.85c, New Orleans; barbed wire, 3.15c, Houston and Galveston, and 3.25c, New Orleans.

Dismantled

MAX SOLOMON CO., Oliver building, Pittsburgh, has purchased two abandoned blast furnaces of Sloss-Sheffield Steel & Iron Co., Birmingham, Ala. The furnaces purchased are Nos. 5 and 6 located at Sheffield, Ala., on the Tennessee river. These furnaces were built in 1888 and abandoned by the company late in 1929. It is estimated that 8000 to 10,000 tons of scrap will be reclaimed from the old stacks.

¶Knapp Monarch Co., manufacturer of electrical equipment, will abandon its plant at Belleville, Ill., because of labor harassments and move to St. Louis or Jacksonville, Ill., according to its president, A. S. Knapp.

They Say:

STOCKHOLDERS have been wiped out in many cases by victories given labor. The American Federation of Labor apparently is taking all the victories and largely at the expense of company stockholders. Yet by actual count many companies have more stockholders than they do employes. Corporations are owned by the public—not by the directors or by the employes. The public has been taking a licking and it is high time the public united and expressed itself."—William N. Parkin, chemical engineer, of Pittsburgh, proposing an organization of stockholders to fight for the rights of the investor somewhat as the labor unions are fighting for workers.

¶"This water is our life blood. If we don't get this aid, our steel center, which now ranks third in the country with a billion dollar investment, cannot survive,"—Mayor Mark E. Moore, Youngstown, O., before the house rivers and harbors committee, Washington, March 20, speaking about development of the Mahoning-Beaver canal.

Transportation

A PROPOSAL made some time ago by a steel plate fabricator and recently approved by the interstate commerce commission is now in the hands of the Trunk Line association for approval, this application asking that railroad freight rates on tanks made of steel plates be on the basis of flat car space available, rather than over-all length.

In other words, the petition asks that the rate apply to the actual space in the flat car taken up by the steel tank exclusive of brake wheels or other obstructions. Formerly, steel plate tank makers and shippers had been charged with the over-all length of the flat car, including the brake wheels.

¶While the Mahoning-Beaver canal project was still being kept warm last week, Maj. W. D. Styer, in charge of federal engineers at Pittsburgh, was holding hearings on a proposed canal joining the head waters of the Allegheny river with Lake Erie.

The route would be up the Allegheny river to Franklin, Pa., then over French creek to join Lake Erie, near Erie, Pa.

Despite opposition of Pittsburgh groups, support is being lent this plan by delegations from such western Pennsylvania communities as Corry, Meadville, Titusville, Franklin, Clarion, Erie and Kittanning. As far back as 1899, federal engineers reported favorably on this route.

¶On a recent Thursday evening at 7 p.m. the C. O. Jelliff Co., Southport, Conn., manufacturer of wire goods, received an order from a customer in Anderson, Ind., for goods not in stock but wanted by the following day. By working all night the Jeliff company filled the order, trucked the goods to the Newark, N. J., airport, and by noon Friday, in 17 hours elapsed time, they were in Anderson.

Financial

AMERICAN ROLLING MILL CO., Middletown, O., reports net loss of $673,089 in 1933, after charges, against loss of $2,029,602 in 1932.

¶Spang-Chalfant & Co. Inc., Pittsburgh, reporting independently of National Supply Co., shows 1933 net loss of $910,692 against 1932 net loss of $900,969.

¶Vanadium Corp. of America reports net loss of $905,560 in 1933, against net loss of $1,651,959 in 1932.

¶Cooper-Bessemer Corp., Grove City, Pa., reports net loss of $176,223 in 1933 as against loss of $609,332 in 1932. Company showed an operating profit in 1933 against an operating loss incurred in the year prior.

¶National Enameling & Stamping Co., Granite City, Ill., reports net profit of $274,097 in 1933, compared with loss of $439,321 in 1932.

¶Laclede Steel Co., St. Louis, reports net loss of $40,483 in 1933, after charges for depreciation and obsolescence, compared with loss of $110,206 in 1932.

¶Directors of the Bearium Metals Corp., Rochester, N. Y., have authorized the regular dividend of $1.50 on the preferred stock paid at once for the current quarter to stockholders of record Feb. 15, plus an extra dividend of $1.50 to apply on accumulated arrears.

¶Otis Steel Co., Cleveland, reports net loss of $1,509,528 in 1933, after interest, depreciation, taxes and other charges, compared with loss of $2,830,155 in 1932.

¶Follansbee Bros. Co., Pittsburgh, reports net loss of $665,571 for 1933, after depreciation, interest and taxes, compared with loss of $1,044,897 in 1932.

Meetings

W. H. POUCH, Concrete Steel Co., New York, was re-elected president of the Concrete Reinforcing Steel institute at its recent annual meeting held at the Edgewater Beach hotel, Chicago.

This two-day meeting was devoted to a discussion of the problems before the industry in connection with the code and its administration, the institute being the code authority for the reinforcing materials fabricating industry. New officers and directors elected include representatives of producers as well as fabricators of reinforcing materials.

G. E. Reuth Jr., Kalman Steel Corp., Bethlehem, Pa., and H. H. Straus, Inland Steel Co., Chicago, were named vice presidents while the following were elected directors for three-year terms: C. M. Gunn, Carle Co., San Francisco; J. W. Jones, Austin Bros., Dallas, Tex.; Louis Meyer, Concrete Engineering Co., Omaha; and Albert Weihl, Pollak Steel Co., Cincinnati.

Directors for two years include: E. E. Griest, Franklin Steel Works, Franklin, Pa.; O. W. Irwin, Truscon Steel Co., Youngstown, O.; D. B. Knowlton, Dudley Bar Co., Birmingham, Ala.; and E. W. Langdon, Joseph T. Ryerson & Sons Inc., Chicago.

One-year directors are: Hugh J. Baker, Hugh J. Baker Co., Indianapolis; B. M. Boisseau, Virginia Steel Co., Richmond, Va.; Ralph Healy, Igoe Bros., Newark; and

W. J. Kibler, Buffalo Steel Co., Buffalo.

Directors elected Louis Meyer treasurer, while R. W. Johnson was re-elected secretary.

¶Pittsburgh District Independent Steel Traffic association held its annual meeting at Fort Pitt hotel, March 20, and elected the following officers: A. R. Kennedy, Pittsburgh Steel Co., chairman; L. G. Hults, United Engineering & Foundry Co., first vice chairman; M. C. Richards, Spang-Chalfant & Co. Inc., second vice chairman, and E. J. Siemon, Pittsburgh Steel Co., secretary-treasurer.

The following were elected to the executive committee: J. F. Davis, Babcock & Wilcox Tube Co., Beaver Falls, Pa.; T. N. Holdren, Pittsburgh-Des Moines Steel Co., Neville Island, Pa.; Lewis Magee, Keystone Traffic Bureau, Pittsburgh; W. W. Larkin, Continental Roll & Steel Foundry Co., Wheeling, W. Va.; B. E. Morgan, Follansbee Bros., Pittsburgh; M. D. Perry, Pittsburgh Screw & Bolt Corp., Pittsburgh; and A. R. Kennedy, Pittsburgh Steel Co., Pittsburgh.

Production

OPERATING gains in the New England, Detroit and eastern Pennsylvania districts were neutralized by a small margin by reductions in the Pittsburgh and Wheeling districts, lowering the steel operating rate last week 1 point to 49 per cent.

This week improvement is scheduled in New England; other districts will be sensitive to a settlement of labor troubles, especially in the automotive industy.

Central eastern seaboard: Up ½ point to 33 per cent last week, with increased rail rollings offsetting tapering operations in other departments. With the exception of one mill the number of open hearths in operation is unchanged, but in several instances the operating periods are shorter. Seasonal improvement is expected shortly.

Birmingham: Unchanged at 52 per cent last week due to the backlog on rails, track fastenings, structural plates and shapes. This rate has held steady since the week of Dec. 9. Fairfield, Ensley and Gadsden report open-hearth furnaces going at about the same pace as before holiday season, with prospects unchanged for a few weeks ahead at least.

Buffalo: Continued at 52 per cent last week, maintaining a rate which has been stationary since the week ended March 3. No major change in production of steel is expected until the labor troubles in the automotive and other fields are decided. This week finds 20 open hearths continuing the production of ingots.

Wheeling: Steel ingot schedules declined 4 points last week to 66 per cent, with melting in 26 out of 39 possible open hearths. This is the second successive weekly decline from a high of 77 per cent the second week of March, which latter rate was the highest operating rate for the district so far in 1934. With two Steubenville, O., blast furnaces now blowing for Wheeling Steel Corp., the one furnace which had been out for repairs is again active.

Pittsburgh: Steel ingot schedules in this district were off 2 points last week to an average of 33 per cent, with the expectation that this rate will be continued this week. Forecasting of ingot schedules, however, is based upon continued amicable labor relations. Eighteen out of 60 steelworks blast furnaces now are operating in this district, a net loss of one, National Tube Co. having banked its one Monongahela furnace. Individual rates are: Carnegie Steel Co., 9 out of 32 furnaces on; Jones & Laughlin Steel Corp., 3 out of 11; Bethlehem Steel Co. at Johnstown, 3 out of 7; and Pittsburgh Steel Co., American Steel & Wire Co. and Pittsburgh Crucible Steel Co., 1 out of 2 each.

Chicago: Held at 48½ per cent despite a slight decrease at some points. A steady trend is anticipated for the next few weeks. Eleven of 36 steelworks blast furnaces active, with the lighting of a Federal furnace giving the district two merchant stacks in blast.

Cleveland-Lorain: Steelworks operations hold at 82 per cent, Corrigan, McKinney Steel Co. continuing with 13 open hearths active; Otis Steel Co. eight; and National Tube Co., Lorain, 11. These units also are scheduled for operation this week.

Detroit: The district was at 100 per cent last week, with all units of the Great Lakes Steel Corp. and the Ford Motor Co. on.

New England: Advanced 8 points to 71 per cent, with indications pointing to a further slight gain this week.

Youngstown: Unchanged at 56 per cent last week, with the rate expected to hold at this level this week, as orders show unexpected stability.

¶Canadian Tin Plate Co., Sarnia, Ont., has completed installation of its second unit and will be in production with it shortly. Orders exceed the capacity of the first unit installed three months ago.

¶Daily average sheet steel production in February was 6958 net tons, up from 5278 tons in January. Shipments averaged 5246 tons, compared with 4222 in January. Sales were down to 6584 tons from 6757 tons in January. Totals for February: Sales, 184,355 tons; production, 194,830 tons; shipments, 146,905 tons. Total sheet capacity in the United States for February was approximately 550,000 tons, and the capacity on which the association's figures are based was 325,000 tons.

Survey Indicates Labor Is Sensitive

WHAT is the situation in regard to steel mill labor and unionization? A survey by STEEL indicates that much less than half the employes of the industry have been organized; conditions vary from plant to plant; organizers are offering inducements to the extent of initiation fees and a year's dues for 5 cents. But the situation is absolutely unpredictable—overnight labor may calm down or it may unexpectedly yield to incitement. Conditions late last week were as follows in various districts:

CHICAGO

Surface indications are lacking of union domination in the industry or of impending disagreement between steel plant operators and workers in the Chicago district, and officials disclaim any serious apprehension over what inroads outside organizations have made into the industry's labor personnel.

Outcome of the automotive strike threat, however, may have an important influence on steel unionization, it is pointed out, and this situation is viewed with some alarm.

It is agreed that the American Federation of Labor, through the Amalgamated association, has made progress in affiliating employes since it first commenced this activity last summer, but it is difficult, if not impossible, for companies to ascertain definitely the actual number of such members except from figures claimed by the union chapters, and in these instances totals are held to be exaggerated and to be less than a majority.

Company unions were established for many years at local plants before the introduction of code regulations, and the extended period during which they have operated satisfactorily as the recognized agencies for negotiations between workers and employers has tended to make the work of the union organizers difficult.

Two of the largest steel plants here point to the number of men who have participated in recent votes on matters relating to the company union as an indication of the continued agreement of employes with this form of representation, although such balloting was not on the direct question of a choice between the company or outside union. From 75 to 80 per cent of all workers cast votes in these instances.

So far there have been no disturbances or demonstrations at Chicago plants. Chapters of the Amalgamated association have been established in the steelworks centers but contacts with workers are carried on largely outside of company property.

Charges of discrimination on the part of employers against outside union members have been lacking.

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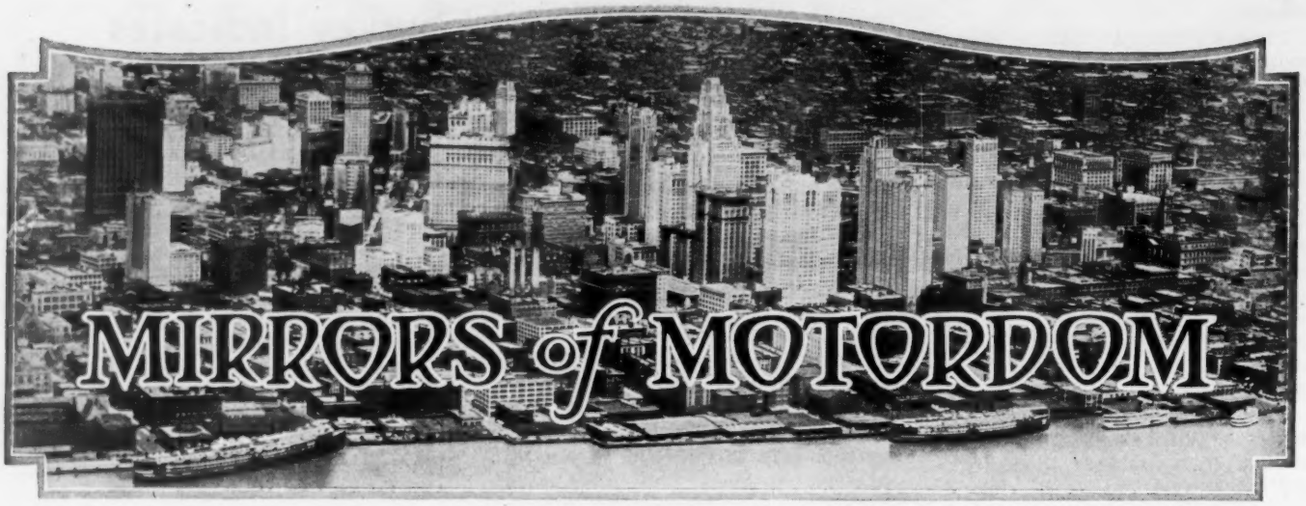

Expect Showdown on Labor

Output Set for Big Bulge

New Models for Hudson

DETROIT

ANYTHING can happen in these times, of course, but Detroit is convinced that after all the present labor trouble blows over automobile manufacturers will again be found carrying the ball.

In 1921 the then-infant automobile industry matured so rapidly it led the country out of that depression. In 1933 it came back faster than any other major industry, and now, by taking a determined stand for the open shop, it is again supplying leadership.

This stand, Detroit believes, will crystallize the labor issue for all industries under NRA, force the administration to come to a clean-cut decision whether it is going to take the right or the left fork, and remove the last major uncertainty retarding recovery.

Having shortened hours (which labor privately does not prefer) and raised wages in accordance with the President's program, automobile manufacturers believe they occupy strategic ground. It is no bluff that they would rather close their plants than engage in a physical conflict and endanger loyal employes. They may grant some face-saving concession to Washington, such as a poll of employes under absolutely neutral conditions, but no more.

Accordingly, Detroit on Friday appraised the situation as follows:

While there may be isolated, sporadic strikes the menace of a complete shutdown of the industry is past. . . . Other industries, including steel, will be encouraged to resist unionization. . . . The edge of labor's drive the country over has been blunted. . . . By about May 1 labor agitation generally will have died down. . . . Also by that time the country will realize that labor has joined banking, inflation, currency and other hazards to recovery which have been surmounted, and buying confidence will revive. . . . Automobile production then will lead an upswing in business, surpassing any previous starts.

STATED as fairly as possible to both sides, the background at Detroit appears to be this:

Labor generally is satisfied, feels it is fairly treated and wants to work. There are a few spots in Detroit, among body and parts makers and not automobile manufacturers themselves, that are regarded as bad and privately are excoriated as much by the industry as by labor. These, however, can be counted on the fingers of one hand and are the exception rather than the rule.

A surprisingly large percentage of the older labor of the industry has been dispersed by the depression, apparently returning to farms or gaining employment elsewhere. In some plants almost half the payroll is young men and boys who have never worked before.

Old labor is disposed to resist unionization. Typical is the case of a big Swede in a Pontiac plant who brandished a monkey wrench at an organizer, declaring that he would permit no one to jeopardize his first steady job in several years.

Young labor is divided, being comparatively easy prey in plants where foremen have been enlisted—many Detroiters would say corrupted—by the unions. The largest single manufacturing unit of General Motors is paying beginners 50 cents an hour and raising them to 58 or 60 cents at the end of the first month; it reports 100 per cent loyalty among younger workers to whom money in their pockets is a novelty.

Unions have made the most headway in plants where they have won over the foremen. At 50 cents a head organizing becomes a profitable side line, and when a foreman intimates that men without union cards don't last over two or three days in his department the $2 initiation fee and $1 monthly dues become cheap employment insurance. It is a safe prediction that more employes have been coerced into joining unions by this method than have enrolled voluntarily.

Union officials in charge of one plant have leased the quarters of a closed bank nearby. They are estimated to have issued cards to 10,000 men, netting them $15,000 in initiation fees, after paying commissions, and $10,000 a month in dues. The union is apparently in a more liquid condition than the bank was.

Labor knows it could expect no widespread public sympathy on the academic issue of recognition, with no possible outcry concerning wages or hours. It also realizes that if it struck, practically all automobile plants would be shut down tight, large supplies of cots and food to the contrary notwithsanding.

The trump card of manufacturers is the fact that hours and wages are not the issue, with a close second the fact that practically every important industry including steel, rubber, lumber, fabric, leather, transportation, glass, lacquer, etc., would be affected by a shutdown. No other industry could so cripple employment and recovery at this time.

Incidentally, no other industry has displayed so great a spirit of independence toward Washington and the "new deal." As related last week, General Johnson was compelled to fly to Detroit to get the automobile code and manufacturers held out for the merit clause.

Efficient as its straight-line assembly method is, the automobile industry very distinctly has its Achilles heel. Being so highly departmentalized, an interruption in any one department would affect all others; cotter pins are as important as engines and bodies.

Hudson is the most highly organized manufacturer, and Flint the

most highly organized city in the district.

In the order named, the President, William Green, head of the American Federation of Labor, and Secretary of Labor Perkins are denounced with surprising vigor for having encouraged organization of Detroit's and the nation's great open shop industry.

THIS underlying confidence of a great bulge in retail sales and hence also in production just in the offing was supported last week by continued taking of steel and other materials.

Because of stocks which still are heavy in some cases, and an occasional quiver of unsettlement, second quarter contracting has been slow, but except in the case of the Bower Roller Bearing Co., where a strike was in progress, no holdups of steel of any consequence were issued.

Generally speaking, production schedules were pushed even more intensively than the week preceding, when there was a slight letup.

Chevrolet assemblies for March up to last Saturday, the 24th, approximated 75,000, compared with 72,273 in all February. Actual output has been higher than the company desired known, and the 5000 mark was attained at least one day. At this rate it now appears that March production will exceed 100,000 units, although it will fall short of the original schedule of 130,000.

About April 15 Chevrolet will formally announce its second, or economy line, of which about 10,000 already have been built and with which some dealers already are stocked. While this line will be the successor to the 1933 standard series, will have semielliptic springs in front and lack some of the trimmings of the 1934 regular series, the word standard will not be used if there is sufficient ingenuity to coin another name. Plymouth also has brought out a lower-price series with the old type of leaf spring and a front axle.

Recently there has been enough gossip about independent springing to make Chevrolet the least bit sensitive and to impel it to avoid any phrase which might indicate that knee-action wheels are not standard or regular equipment. Following the formal introduction of the economy series—primarily a car for fleet buyers—a sport sedan with knee-action wheels will be brought out in May. This is expected to confirm Chevrolet's adherence to the new springs.

Incidentally, a good deal of recent institutional advertising by General Motors itself, not by its subsidiaries, and emphasizing three successes in a row—no draft ventilation, knee-action wheels, and streamline designs—is calculated to counteract gossip detrimental to independent springing.

Ford is rather definitely in second place at about 4000 units a day, 5 days a week, and holding steadily at that level. The new Victoria with a radical streamline rear but a standard front end is now on the floors of most dealers.

Ford dealers are now stocking pants for the rear wheels of all models. Thus far these pants have been made by independent parts makers, and are rapidly becoming available for all other models as well as Fords.

Ford V-8 engines are being used to power a small fine car, on a converted Ford chassis lengthened to 127 inches, made by Brewster & Co., a subsidiary of Rolls-Royce of America, Springfield, Mass. These models are priced at $3500.

Hudson-Terraplane, holding rather steadily at 800 to 900 a day, 5 days a week despite a slight easiness in retail sales due to the threat of a strike, is offering a fabric top brougham. A convertible coupe in both the Hudson and Terraplane lines will be marketed shortly.

Chrysler is now meeting delivery requirements on Plymouth and Dodge, but continues far behind on the airflow DeSoto and Chrysler models. The March schedule for Chrysler six and eight is 8000. Daily production of the Chrysler airflow line is 200 a day.

Despite utilizing space in the Willys-Overland plant at Toledo and the Continental Motors plant in Detroit, Chrysler still is short of manufacturing facilities, and in the past week has distributed stamping orders with a liberality rarely encountered in Detroit.

There is some underground gossip that the yearning of Walter P. Chrysler to emblazon his name in the high-price as well as the low-price field will be satisfied before many months elapse.

Although an unusual value, the Chrysler imperial eight has never broken into the "class" group. The merger with Chrysler of one of the oldest and best-known high-price manufacturers in Detroit is being quietly rumored, although the price of this company even at today's comparatively low stock market quotations would appear prohibitive.

Packard is again rumored as contemplating entry into the moderate-price field. It is established that considerable experimental work is being conducted by Packard, but judging from its gait in making model changes in the past this might be the start on the 1935 line. However, Packard will bear watching.

Here and There In Industry

HURLEY MACHINE CO., Chicago, has purchased the building and equipment of Meadows Mfg. Co., Bloomington, Ill., manufacturer of electrical and gasoline washing machines. The Hurley company is a manufacturer of washing and ironing machines.

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Steel Industries Engineering Corp., Pittsburgh, through its British representative, Ashmore, Benson, Pease & Co. Ltd., Stockton-on-Tees, Eng., has recently received an order for two electric rotary clay guns from Richard Thomas & Co. Ltd., England.

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Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa., has appointed Day & Goater, 50 Church street, New York, authorized sales agents for the metropolitan district for products of its reinforcement department.

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Westinghouse Air Brake Co. and Union Switch & Signal Co., Pittsburgh, will remove their New York offices about May 1 from the Westinghouse building, 150 Broadway, to the Empire State building.

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Charles Dreifus Co., Pittsburgh, iron and steel scrap, has established offices in Worcester, Mass., in the Park building, in charge of Ernest A. Austin, formerly associated with Perry, Buxton & Doane, Boston.

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General Electric Co., Schenectady, N. Y., has been awarded a contract totaling about $779,000 by the war department, Washington, for motors, controls, switchboard and dredge parts for use at Fort Peck, Mont., through its engineer office at Kansas City, Mo.

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DeWolf Furnace Corp., Rochester, N. Y., has appointed Bradshaw & Co., 530 Fourth avenue, Pittsburgh, its representative for steel-supported, aircooled or insulated walls and arches for power plants and industrial plant uses. The appointment covers western Pennsylvania, eastern Ohio and all of West Virginia.

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United States Pipe & Foundry Co., Burlington, N. J., has opened a sales office in room 608 Earle building, Washington, in charge of S. E. Linderman. It will also open a sales office April 1 in the Consolidated Gas building, Boston, in charge of Carl N. Brown, formerly in the Kansas City, Mo., office. The latter is succeeded by R. C. Lemert from the office at Birmingham, Ala.

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Homestead Valve Mfg. Co., Coraopolis, Pa., has appointed Beckwith Machinery Co., Pittsburgh, its distributor for Pittsburgh territory for its hypressure jenny, a portable high-pressure machine for removing dirt, grease, paint and similar materials. The first sale by this representative was to the Wheeling Steel Co., Wheeling, W. Va., for use in its strip mill for cleaning windows, greasy floors and machinery in the interest of safety.

WINDOWS OF WASHINGTON

Who Gets Buck on Labor?

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Johnson in Hole on Prices

• • •

Campaign Issue Is Forming

WASHINGTON

THERE is a legend in Washington that Franklin D. Roosevelt excels all previous occupants of the White House in harmonizing men, bridging impasses, composing differences between irreconcilable groups and in general performing as an all-round political Houdini. In fact, he is said to be at his best when pushed into a corner.

Well, the issues that have arisen the past few days, principally over NRA and including the automobile and general labor situation, the federal trade commission report criticizing the pricing provisions of the steel code—and inferentially of all codes, and the storm which has blown up over the Wagner labor bill, are testing that legend.

It may be because it's spring, or that this is the 13th month of the "new deal," or that business has recovered sufficiently to take on a degree of irritability usually associated with convalescence, or that industrial leaders have finally shaken off their inferiority complex—but whatever it is, a first class rebellion is brewing in the land.

Not until the President, apparently in haste and admittedly with misinformation, canceled the air mail contracts was any real voice of doubt—let alone protest—raised. That incident, coupled with the increasing insolence of organized labor, broke the spell of infallibility, encouraged opposition and galvanized the business community into action. Rarely has any President listened to such a hard "no" as Mr. Roosevelt received from automobile manufacturers last week.

In view of the President's genuinely-remarkable prformance the past year there is no solid reason yet for believing that the present crisis is insoluble. Probably no other man in public life can shift positions so plausibly or readily, or is so sensitive to public sentiment and responsive to numbers. It will be the greatest feat of all if the President can appease industry at this time without alienating labor, but it can be done.

THE crisis, of course, centers on labor. Because labor and "the little fellow" elected him, the President has favored him at the expense of industry. In the vein of the cartoon on p. 11, the administration has fed raw meat to labor and then gone to industry and warned that it would be eaten alive by this creature if it were not mollified.

Reverting to the previous reference to numbers, the strength of organized labor has been preached in season and out by its leaders. Now industry is learning the trick. It was no mere coincidence that last week the General Motors Corp. announced it has exactly 351,949 stockholders, or almost twice the number of men employed in that sector of the automobile industry in which a strike is now threatened. That is language which the administration understands.

From the administration's viewpoint, organized labor selected the poorest kind of battleground in picking on the automobile industry. No other industry fans out so rapidly and affects so many supply trades. Labor also chose the weakest issue—recognition. Having conceded shorter hours—which when considered in the light of the entire year is no concession—and higher wages, automobile manufacturers came into court with practically clean hands. Their co-operation was practically 100 per cent.

When the President decided to back away from the air mail issue the responsibility was lodged elsewhere, as the stories afloat in Washington concerning Secretaries Farley and Dern and Attorney General Cummings attest. It is just possible that the President will be able to point out to William Green and other labor leaders that organized labor had its chance, that the administration wrested higher wages and shorter hours out of industry, that it bungled in threatening to crack down on the automobile industry and upset recovery at this time.

There are, of course, harsh measures which the President can utilize. The power to license industries, granted in the recovery act, has never been exercised. More than once has the suggestion of a dictator for industries been made at the White House. But Washington doubts if these stern resorts will be brought into play. A year ago they might have been justified, but the recovery in morale and even of individualism is now too marked.

In this crisis the President is leaning more on Secretary of Labor Perkins than the so-called "new dealers." It is a safe prediction that the President will not permit organized labor to undermine his recovery program, he feels more warmly toward the automobile industry than any other large group, and that some one high in the administration will be the goat for having permitted last week's impasse to occur.

Nor can this be forgotten. In November all representatives and a third of the senate is elected. The Republican party is not anxious to be in the position of opposing labor, any more than are Democrats, but the revolt of such major industries as steel and automobiles against the regimentation of NRA may provide the wanted issue.

A FIRST class family row is in the making as a result of the trade commission's report attacking the steel code's pricing methods.

In this case the steel industry is the bystander, and it is going to be

hurt. But the trade commission places the primary responsibility on NRA. In other words, NRA wasn't on the lookout for the consumer and sanctioned questionable practices.

This matter of open prices, and to a lesser degree basing points, is bothering the President personally. He cannot reconcile any system that results in one price bidding, though conceding that the remedy has not yet occurred to him.

It will be recalled that about two months ago, when General Johnson requested the trade commission for a report on price matters under the code, the commission sent the reply direct to the White House. The consumers' board of NRA is more disposed to side with the trade commission than with the general.

The inevitable result is that the general is being squeezed between a vise, and the way out is for the steel industry to make some adjustment. Presumably this will be done officially on May 21 when and if the steel code is extended. Any prior revision would have to be with the full consent of the industry. Representatives of the steel code authority were meeting Friday afternoon in Washington, probably discussing the report.

Senator Borah, it will be recalled, instigated the trade commission's report because he feared the antitrust laws were being trampled under foot. This has given Washington a double snicker—a Republican senator lambasts a Democratic administration for not enforcing the antitrust laws, and Senator Borah, the prime "againster" in politics, at last being for something!

It was a typical speech for the benefit of the hustings that Senator Borah delivered last week in summarizing the trade commission's report. He urged the committee to report favorably on his bill to "give us an opportunity to restore the antitrust laws so as to protect the small business man, to protect labor and to protect consumers in the United States from what practically amounts to economic feudalism."

Imagine the position of the steel industry when the trade commission charged last week that it was favoring the automobile industry with lower prices at the expense of small consumers. This is the same automobile industry which felt so aggrieved recently at not receiving proper differentials that it threatened to go into the steel business itself! The report promises to become a best seller among automotive purchasing agents in Detroit, with free distribution by steel salesmen.

Progress with Sponge Iron

Progress in making sponge iron from ore from the Moose Mountain mine near Sudbury, Ont., is reported by Consul J. B. Jackson, at Port Arthur, Ont.

FTC Says NRA Forces Steel to Ignore Basing Point Ruling

THE report on the steel industry by the federal trade commission, transmitted to the senate last Tuesday in response to Senate Resolution 166 (Feb. 2, 1934), deals primarily with alleged price fixing and increased prices of steel products under the NRA steel code.

It embraces a large volume of "evidence" in the form of excerpts from letters, which the commission believes is proof that the steel code under NRA "requires" or "permits" steelmakers to indulge in monopolistic practices, to violate the commission's Pittsburgh-plus decision handed down in 1924, and to participate in a price system which is discriminatory in character. It also points to several features in the administrative machinery of the steel code authority which it claims tend to prevent free, independent action by members of the code.

The report is a document of 40,000 words, divided into four chapters as follows:

I. The Practice of the Steel Industry under the Code with Reference to Price Fixing.
II. The Increase of Price of Steel Products.
III. Historical Background of Present Price System.
IV. General Conclusions.

Chapter I, comprising 75 per cent of the report, is in 18 sections. Section 1 is a general survey of the steel code, in which the principal point is that under the allocation of voting power in the steel code authority, "the U. S. Steel Corp. and its subsidiaries would have approximately 40 per cent of the total voting strength and Bethlehem Steel Corp. about 13 per cent. Eight other concerns would have a combined voting strength of about 30 per cent, with the largest of them having only a little over half the strength of Bethlehem. The remainder of the voting strength would be distributed among 50 concerns, the strength of the largest being about 1½ per cent."

Price System "discriminating"

Sections 2 to 14 deal with the alleged limitations of Schedule E of the steel code. The text touches upon basing points, methods of determining prices, "discrimination" against water and truck transportation, deviations from base prices (commercial resolutions), uniform extras, etc. The following relative to basing points is indicative of the tenor of the commission's argument:

"It is a conservative statement that the power to select, discontinue or increase the number of basing points involves the power of deciding what cities shall be handicapped and what cities shall be built up as centers for the remanufacture and processing of steel products. The importance of such a a power over the future of communities can hardly be overstated. The tendency is distinctly against what is commonly considered as desirable decentralization of industry."

In Section 16, referring to the code limitations on steelmaking capacity, the report states that this restriction "has the effect of artificially protecting investments in obsolete equipment, of maintaining or increasing costs at the basing point mills, and of making necessary a higher basing price at the older basing points."

Declares System Monopolistic

Sections 17 and 18 refer to the general effects of code practice on competition. The hint of "monopoly" is embraced in the final paragraph of Chapter I:

"When an industry proceeds on the premise that it is unfair for competitive sellers to share the natural advantages of their locality with the buyers in that locality, it is in essence the monopolization by the sellers to the exclusion of the buyers of the natural advantages inherent in the natural resources of that locality. To monopolize the advantages inherent in natural resources is little different from monopolizing the physical resources themselves."

In Chapter II the report shows price increases established since the code became effective and places much emphasis upon the fact that the increase in base quotations represents only a part of the net increase to the buyer—a substantial "hidden" increase being imposed by increases in uniform extras.

Chapter III reviews steel price systems from 1880 to date, mentioning the old pools, Gary dinners, Pittsburgh-plus, the period from 1924 to 1933 (following Pittsburgh-plus decision) and finally the code period. The chapter winds up with the statement:

"The code therefore in effect declares unfair and unlawful the practice of f.o.b. mill base pricing which the commission assumed to be fair competition. But more than this it requires important steel producers to violate the commission's order* and permits all to ignore it."

An idea of what the commission hopes to prove in Chapters I, II and III is afforded by the following authorized statement of conclusions:

"Under the provisions of the code and the methods of its application,

*Commission's Pittsburgh-plus decision of 1924.

prices for any given product at any point of delivery are uniform. This is accomplished by:

1. The mill base prices are either identical at the time they are filed with the code authority or become so almost immediately. The authority may reject any price which it determines to be unfair and if the member fails to file a satisfactory price, it may fix the price.

2. No seller can make deductions from the mill base price greater than the code authority may approve and every seller must add to that base price the minimum of extras (for quantity, quality, shapes, sizes, processing, etc.) required by the code authority. Under the code provisions any extra "shall be uniform for all members of the code."

3. Prices charged must be for the delivered product and the charge for freight must be the amount of the freight from the basing point of the district, no matter from what point the goods are shipped.

"This price system—

A. Is in violation of the Pittsburgh plus order which not only prohibited the respondents therein from the use of the Pittsburgh basing point but also "from quoting for sale or selling .....upon any other basing point than that where the products are manufactured or from which they are shipped."

B. Tends to eliminate the small

Institute Charges FTC Report Is Incomplete and Inaccurate

BELIEVING the public is entitled to know where the steel industry stands with regard to the federal trade commission's steel report, the American Iron and Steel institute on Wednesday issued the following statement:

The report indicates that the commission is not in sympathy with the national industrial recovery act or with codes of fair competition approved thereunder, at least if such codes contain provisions regulating commercial matters.

In the press release issued by the commission it states that its report "contains evidence in support of" its conclusions. In the report, however, the commission states that "statements of facts and conclusions hereafter expressed are intended to be statements that the commission has reason to believe that the facts and conclusions are as herein stated." It would thus appear that the commission does not intend to have it understood that it has considered all the evidence on any of the questions dealt with in the report, but simply that it has obtained some evidence which would support the statements made in its report, if this evidence were not contradicted or disproved, as well it might be, were all the facts known.

The steel industry regrets that the commission has seen fit to make a report on an incomplete investigation. The results which such a report can produce must be harmful, because it might be understood to call for action that should be taken only after the fullest investigation and the most careful consideration of all the facts and of the principles of law that are applicable thereto.

We believe that all the matters which the report undertakes to criticize can be satisfactorily explained and that the explanations will show that the provisions of the code are entirely legal, and that they are designed to promote the purposes sought to be accomplished by the national industrial recovery act.

The report shows that many of the provisions of the code to which reference is made have not been understood by those who have made the investigation and prepared the report or have not been correctly applied. For example, the report indicates that under the code the voting power of the two largest interests in the industry is approximately 53 per cent of the voting power, basing this figure on the percentage of total ingot capacity controlled by such interests. The fact is that under the code the voting power of its members is determined on the basis of the dollar value of their sales during the previous calendar year. The aggregate voting strength of the two interests in question is substantially less than that which the commission attributes to one of such interests alone.

Report Errs on Voting Power

Again, the inaccuracy of the report is shown by the statements made therein regarding the number of concerns that are members of the code and have the right to vote upon matters submitted to them. Although the representatives of the commission were advised that more than 240 concerns are members of the code and the code itself provides that each member shall have at least one vote, nevertheless the report makes the inaccurate statements that on the basis of the figures available to the commission 10 concerns would have 70 per cent of the voting strength, and that "the remainder of the voting strength is distributed among 50 concerns." The commission could have known upon the asking the voting rights of each member under the code. It did not ask for the facts.

Furthermore, the administration of the code is in charge of the board of directors of American Iron and Steel institute, in the election of which board each member of the institute has only one vote. The board is composed of 30 members, each with the same voting power. Only six of such members are in any way connected with the two interests mentioned.

The report also shows that those who have made the investigation and prepared the report have given ear to a small minority of purchasers of steel products who have made complaints mainly seeking to continue as against their competitors discriminatory advantages which they enjoyed prior to the effective date of the code. The continuance of such advantages would prevent the code from being effective as a code of fair competition.

It is true that there have been some increases in the prices of steel products covered by the code. It is also true that many of these products are still being manufactured and sold at a loss after more than six months of operations under the code. If there is any real complaint which calls for remedy, it is that the prices of many of the products are still too low. The commission admits that it has not considered the increased prices of the materials which the members of the industry must buy or the increase in manufacturing costs of steel products by reason of the higher wages that have obtained since the code was approved.

In making its report the commission appears to have been unduly influenced by its findings in the so-called Pittsburgh basing point case and the order which it made in 1924 in that case, which was not directed against the industry as a whole. The steel code does not apply the Pittsburgh basing point system against which the complaint of the commission was directed. Pittsburgh is only one of the numerous basing points listed in the code, which are for the most part large producing centers.

Whether or not the system of quoting prices adopted in the code conforms to certain theories of economics, it is the system under which the industry has been built up in this country. It is the only system by which conditions of fair competition among members of the industry and among the users of steel products can be established and maintained. The use by the industry of any other system of quoting prices would result in grave dislocations of producing activities and of relations between producers and purchasers of steel products. It would increase rather than decrease unemployment and would defeat rather than accomplish the purpose of NIRA.

The steel industry believes that it is particularly to be regretted that a government body clothed with judicial or semijudicial powers should make any report or recommendation which admittedly is based upon an incomplete investigation.

enterprise not located at the basing point by requiring it to charge the same amount for freight on deliveries in its immediate vicinity as if the product had been in fact shipped from the basing point which is commonly a point at which mills of large competitors are located.

For example, a steel mill which is located in Duluth must charge its local customers the uniform mill base price charged by other mills in its district and, in addition, $6.60 per ton for all rail freight from Chicago which it does not pay.

C. Results in net mill prices which are discriminatory—such price differentials not being related in any way to the cost of handling the business.

For example, the Duluth mill referred to above, on its local sales, must charge $6.60 per ton for freight which it does not pay. If it sells to a customer in Chicago it must pay $6.60 per ton freight which it cannot charge—making a difference of $13.20 per ton in the amount of the sale price which it has for itself.

D. Discriminates against fabricators who are located at mill points which are not basing points because they can no longer obtain their supplies at the mill base price of the mill which supplies them but must pay, in addition, the equivalent of rail freight from a distant basing point, although such freight shipment was never made.

E. Has a tendency to centralize the producing and fabricating industries at the basing points in order to overcome the effect of the imaginary freight charges.

F. Minimizes the usefulness of waterway and truck transportation because of the imposition of all-rail freight, and because of the very limited allowance made where customers haul in their own trucks.

G. Results in uneconomical cross-hauling of products between basing point areas. Evidence of this was developed in the Pittsburgh-plus case and in other investigations.

H. Places powerful manufacturers or groups of manufacturers in a position to compel the industry to discriminate in their favor. The Detroit automobile manufacturers have forced the code authority to approve an arbitrary differential in favor of southern Michigan, of $3 to $5 per ton.

I. Causes discrimination against such important steel producing centers as the Mahoning valley in Ohio (Youngstown district).

"The effects of the price system listed in the foregoing are, in general, effects which result inevitably from application of provisions of the code. There is also one serious result which is due to determinations made under authority provided by the code but not, strictly speaking, under any requirement thereof. We refer to price increases which have taken place since the code has been in effect and particularly to those price increases for extras which are imposed by the code authority. These price increases for extras are directly traceable to action authorized under the code and discriminate particularly against purchasers of small quantities. This is illustrated by the "extras for quantity" to be added to the basing prices for tool steel. The current average price of tool steel is about $2.45 per hundred pounds. The extras to be applied to the base price on account of quantity for small quantity purchases have been increased on the order of 400 per cent, and an average of such increases amounts to more per hundred pounds than the total of the base price.

"In addition to the results indicated above which flow from the application of the code to manufacturers, prices, the maintenance of resale prices by jobbers, etc., is authorized by the code and required by its application. No member of the code can sell for resale to any purchaser, at any discount from his base quotation, unless such purchaser binds himself not to resell at a price below that at which the member might at that time sell to such third party.

"Because of the power of the code authority to determine who may be classified as jobbers, the authority is able to force out of the jobbing business concerns who have long been engaged in that business but who do not conform to an arbitrary definition of the term 'jobber.'"

The complete text of Chapter IV of the commission's report, headed "General Conclusions," follows:

"The question naturally arises whether this situation of enforced violation of the commission's order in the Pittsburgh-plus case can be harmonized with the terms of the national industrial recovery act and the powers therein conferred.

"The national industrial recovery act looked forward to the authorization of codes of *fair* competition. True, it conceived the possibility of such codes designedly authorizing practices hitherto forbidden by the antitrust laws of the United States, but at the same time, it sought to restrain the promulgation of codes that were designed to promote monopolies or operated to eliminate or oppress or discriminate against small enterprises. Furthermore, it expressly prohibited codes from permitting monopolies or monopolistic practices.

"A distinct conflict of means and objectives exists between the provisions of the code and the commission's order in the Pittsburgh-plus case. That conflict raises questions not only of legal import but of basic economic implication. Departure from hitherto accepted policies of governmental concern over the maintenance of fair competition is, however, evident. Nevertheless it has been assumed thus far that the departure has the sanction of a congressional mandate embodied in the national industrial recovery act. The test of whether such a sanction is actually present in that act can, of course, be submitted to the courts for determination. But other means for the solution of such an issue are also available. The work under national industrial recovery act was conceived of as necessarily being largely experimental. The act itself provides not only for means to pursue effectively paths demonstrated to be sound and desirable, but also for means to withdraw from the enforcement of policies which evidence a tendency to attain ends regarded by the act as those that our national economy has discarded."

Advantages of Basing Point System

By An Eastern Pig Iron Producer

THE old order of selling steel and pig iron has changed rapidly with the advent of the iron and steel code. No longer it is possible for a selfish producer, either of pig iron or steel, to raid his distant competitor's natural field of operations by price cutting, openly or otherwise, while maintaining a published price schedule in his own back yard. Heretofore, tonnage which could not be readily absorbed at home was "dumped" in distant consuming areas. Vicious price cutting made this procedure possible.

No longer is it possible for buyers of substantial tonnages to dangle attractive orders before the trade, until eventually some weak-kneed seller succumbs to what, at that particular moment, appears to be an attractive volume of business, breaks the market and meets the buyer's ideas of price, no matter how ridiculous they may be.

In the first place, even if so inclined, the seller cannot quote below the price set by the basing point in whose territory the buyer is located without filing with the American Iron and Steel institute, a revised schedule announcing his intention to reduce the price ten days in advance of the effective date. Meanwhile all other interested producers are informed of the impending change and they, in turn and without the necessity of filing a changed schedule, may meet the new price immediately it becomes effective.

This "ten day" period is the life blood of the iron and steel code. It is the one feature which produces a condition of fair competition. Its removal would spell disaster to the code itself.

Assume that a producer desires to reduce the price to a larger consumer located in another basing point territory. Such a reduction would have to be sufficient, in order to be of advantage price-wise to that buyer, to more than overcome the freight disadvantage. In other words, it would have to be an amount greater than the amount of freight which that pro-

ducer must otherwise absorb. That, in the majority of cases, would represent a drastic reduction. Since such reduction would of necessity also apply to that producer's back-yard customers, it wouldn't be worth the candle.

System Limits Territories

No producer can have more than one published price schedule and that schedule applies to all of its territory. Incidentally, the territory of any basing point is the area in which its delivered price must be respected by those operating at or on other basing point price schedules. It covers all consuming points on shipments to which the basing point nets its full published price schedule and requires no additional freight rate absorption. In other words, the moment a basing point producer's base-price-plus-freight results in a delivered price in excess of a similar combination from another basing point, then that producer is outside of his own territory and in the territory of another and different basing point. He must then respect the price schedule of the latter under penalty of a fine for violation.

Strange to say, there are buyers of iron and steel products who do not yet fully comprehend the new order. Every iron and steel producer in the United States has now placed on file and must at all times maintain on file with the institute his base prices for all the iron and steel products he manufactures. All extras now being uniform, the price at destination on any given material is simply determined because the only other factor in the delivered cost is the lowest freight rate from the nearest basing point.

A basing point may embrace a group of producers located in one city as, for example, Buffalo, Birmingham or Pittsburgh, or it may be an isolated mill or blast furnace. The isolated basing point apparently is in position to offer the most in the way of price protection to the customers it normally serves (unless it foolishly raises its price schedule so high as to deprive its customers of their natural freight advantage), because it forces the more distant competitor to absorb the difference between his relatively high freight rate and the basing point's lower one.

A Pennsylvania producer may sell in Chicago, provided he is willing to absorb his freight handicap and sell at a figure no lower than the Chicago delivered price, but that isn't offering anything to Chicago consumers which they haven't got right at home, specialties excepted. An Ohio pig iron producer may attempt to get an order from New Jersey or New England, but here again nothing is offered except the poorer service which the longer haul necessarily involves.

Wherever a consumer is located, he is under the steadying influence of some basing point. The importance of that basing point to him and its influence on the prices he pays is normally the exact difference between the freight rate to his siding from his basing point and the freight rate from the next nearest basing point or points. In rare cases this difference may be partially offset by a lower price schedule from the next nearest basing point, but basing point prices cannot vary enough to more than offset the difference in freights to any common point. If it does the basing point changes immediately. In some cases the difference between the freight rates from two or more basing points to the consumer plant may be inconsequential, but in many instances the difference is represented by several dollars per ton.

Assume the present basing point carries a freight rate to the buyer's siding of $2 per ton and that the next nearest basing point carries $3.50. By glancing over the present published base price schedules, it would appear fair to assume that this consumer and all the others in the same area win to the extent of $1.50 per ton merely by reason of having, fortunately, a nearby producer who has been designated as a basing point. To paint the picture a little clearer, just compare the latter's published prices with those of the next nearest basing point (most likely one will find them identical) and then compare what a given product would cost in the matter of freight rate alone if the consumer's present basing point hadn't been designated as such. One would not only pay the higher price but so would every other consumer located in the area which is now dominated by the basing point's lowest base-price-plus-freight combination.

Certain fairly large sections more or less isolated and distant from the next nearest basing point or points might easily have to pay excessive freight costs running into millions of dollars annually and for years to come.

Freight Often Burdensome

If a consumer studies the published basing points for the many and varied iron and steel products which the code covers, he will find a large number separated by hundreds of miles from the next nearest basing point. The freight difference to a common point, say, 10 miles from the nearest and 500 from the next would represent a staggering freight item.

The iron and steel code, subscribed to by every producer of importance in the country, is with us. With changes and modifications here and there, it bids fair to remain an integral part of the industry for a long time. The consumer should not overlook the importance of his basing point as effecting the ultimate cost of material placed at his siding.

Died:

CARL S. FORKUM, 52, superintendent of blast furnaces, American Steel & Wire Co., Donora, Pa., in Pittsburgh, March 19. At one time he was northern superintendent of blast furnaces, Republic Steel Corp., Youngstown, O.; superintendent of blast furnaces, Jones & Laughlin Steel Corp., Aliquippa, Pa., and of the Joseph E. Thropp furnaces at Saxton and Everett, Pa. He became associated with the American Steel & Wire Co. in 1914 as assistant superintendent of Central furnaces, Cleveland, and in 1918 was appointed superintendent of the Donora furnaces.

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S. M. Wetmore, secretary and sales manager of the United Forge & Machinery Co., Detroit, March 8.

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Joseph H. Kummer, general sales representative, Fort Pitt Malleable Iron Co., Pittsburgh, in New York, March 17.

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Thomas L. Green, president of Thomas L. Green & Co., Indianapolis machinery manufacturer, in Florida recently.

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John Dunning, retired steel plant superintendent and at one time reported to be an authority on steel rolling methods, at his home in Auburn, N. Y., March 8.

□ □ □

Rudolph F. Flintermann, 62, president and founder of the Michigan Steel Casting Co., Detroit, in that city, March 7. In 1901 he was appointed chief metallurgist for the International Harvester Co., Chicago, and in 1907 removed to Detroit where he organized the Michigan Steel Casting Co.

□ □ □

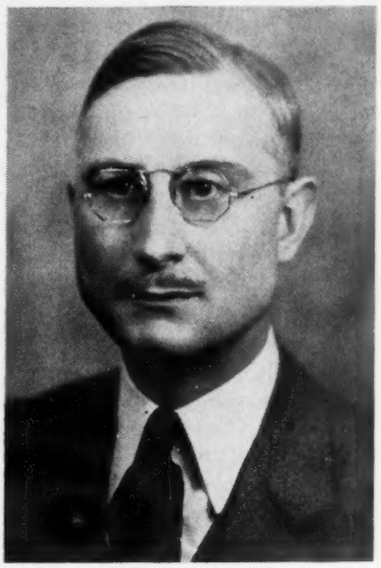
Edward M. Sparhawk, 66, sales representative for a number of steel companies, in Denver, March 5. In 1901 he was placed in charge of Denver sales for the Illinois Steel Co., Scully Steel Products Co., Carnegie Steel Co., American Sheet & Tin Plate Co. and the Tennessee Coal, Iron & Railroad Co. He continued in this capacity until his death.

□ □ □

Edmund W. Zeh, 66, founder and president of the Zeh & Hahnemann Co., manufacturer of power presses, in Newark, N. J., March 17. Born in Frankfort-on-Main, Germany, he came to this country in 1893 to see the World's fair at Chicago and remained to work with a Buffalo company. Later moving to Newark, he founded his own company in 1907 and since that time was active in design and development of power presses.

Industrial Men in the Day's News

Ernest G. Stage, Secretary, Treasurer and General Manager, Lincoln Steel Works, Lincoln, Nebr.



Beginning his career as stevedore, at the age of 38 he directs a large structural steel company.

This company recently has purchased assets of two smaller fabricators, enlarging the scope of its work.

A proficient pilot during the war, he is enthusiastic over aviation and its promotion in Nebraska.

ERNEST G. STAGE, secretary, treasurer and general manager of the Lincoln Steel Works, Lincoln, Nebr., directs operations of one of the largest structural steel fabricators in the Missouri valley, which recently expanded its facilities by purchasing assets of the Westover Iron Works, the latter specializing in ornamental iron construction.

Starting his career as stevedore in a packing house at the age of 17, he worked his way to the post of assistant division superintendent. He left this position to join the aviation service during the World war, acquiring the reputation of an accomplished pilot.

He has never lost his liking for aviation, at present being engaged in studying out a standardized plan for airports in Nebraska.

Returning from the service, he entered employ of the Standard Bridge Co. and began the study of structural engineering. After successive advances he became associated in an executive capacity with this company which, incidentally, was taken over by the Lincoln Steel Works last October.

Later, Mr. Stage was affiliated with the Omaha Steel Works and the Gate City Iron Works. About this time he designed a lubricating hub cap and started a small plant in Lincoln to manufacture it. The business prospered and ultimately was sold to eastern interests.

In February, 1929, with F. J. Daugherty of Omaha, Nebr., Mr. Stage acquired control of the Lincoln Steel Works and has been active in the development of the company since that time. He has been adviser to Governor Bryan of Nebraska on numerous state engineering projects. At 38 he is recognized as one of the best qualified structural and concrete engineers in the state, being intensely interestd in promoting employment for American Legion men and unemployed steelworkers.

□ □ □

Harvey Dieterich, manager of the structural department of Joseph T. Ryerson & Son Inc., has been made assistant vice president in charge of the operations of the structural and special order departments in Chicago. He has been with the company for 30 years.

Ainslie Y. Sawyer, who for 25 years has served in almost every division of the Ryerson sales department from manager of the export materials department to manager of the cold-finished steel division, has been appointed assistant general manager of sales. He will specialize on the field promotion of the company's products.

□ □ □

G. W. Van Syoc has resigned as assistant purchasing agent of the Auburn Automobile Co., Auburn, Ind.

□ □ □

Arnold L. Nacke has been appointed New York representative, with offices at 50 Church street, for the stamped and pressed metal division of Geuder, Paeschke & Frey Co., Milwaukee.

G. Douglas Morse has been named New England district representative, with offices at 542 High street, West Medford, Mass.

Gustav A. Reinhard represents the company in the Cleveland district with offices at 1935 Euclid avenue.

□ □ □

John E. Wetzel, vice president and general manager of sales, Superior Steel Corp., Pittsburgh, and David Pryde, works manager of the company, have both been elected directors, succeeding Arthur Galston and Bruce Borland.

□ □ □

Julius P. Heil, president of the Heil Co., Milwaukee, has been elected chairman of the new Wisconsin state NRA advisory board, which supplants the former state and Wisconsin-Illinois district recovery boards.

□ □ □

W. F. Detwiler, vice president and general manager, Allegheny Steel Co., Brackenridge, Pa., has been elected to the board of directors and named executive vice president.

□ □ □

James Bryden, works manager of Smith & McLean Ltd., Gartcosh Steel & Iron Works, Gartcosh, near Glasgow, Scotland, is in the United States for a trip which will last about a month. His address while in this country is the William Penn hotel, Pittsburgh.

□ □ □

H. D. James, control expert and long a consulting engineer of the

(*Please turn to Page* 77)

Wilbur G. Hudson

Who as noted in STEEL for March 19 has been appointed chief engineer of the Pershing road, Chicago, plant of Link-Belt Co.

EDITORIAL

Let's Decide on Something and Stick To It!

THIS most interesting period in the evolution of a workable mechanism for recovery affords innumerable examples of the shortcomings of government regulation of industry. It is impossible to examine any activity anywhere without finding signs of confusion, restraint or waste caused by government meddling.

* * *

For instance, take the case of a typical manufacturing concern of moderate size. It is receiving an encouraging volume of business. It is operating under a code of fair competition. The code provides for an average of 40 hours per week, with permission to go to a maximum of 48 hours for a short period to allow for emergencies.

Recently the company has been unable to recruit a sufficient number of certain skilled workers to man an essential department. The production of this department sets the pace for the entire plant. The management is in a dilemma. If it holds the skilled men in this key department to code hours, it deprives the workers in other departments of available work and consequently curtails their purchasing power, which is contrary to the intent of NRA. On the other hand, if it ignores the code by working the skilled men more than 48 hours a week, it is subject to the penalty of a fine, in spite of the fact that its offense actually has increased employment and purchasing power—the specific aim of NRA.

This situation exists in hundreds of plants. Plant managers have appealed to code authorities and to NRA officers, but the machinery of bureaucracy is so ponderous that no prompt relief has been forthcoming.

* * *

Again, take the case of a fabricating plant in a city of less than 100,000 population. It employs about 250 men. No ripple of labor discord had ever disturbed the relations between the proprietor and his employes until last year. He knows them all by their first names. They do not want to bargain collectively.

Yet since last summer union labor organizers from a distant large city have visited the workers at their homes. They have told the workers and their wives that President Roosevelt will force the proprietor of the shop to sign an agreement with the national labor union and that the workers who do not become members of the union will lose their jobs.

Many of these workers have gone to their employer for counsel. This is natural because in the past he has advised them on various matters—details in the purchase of a home, where to send the oldest son to college, etc.

But the employer is embarrassed by this request for advice. He knows that he should tell his men not to have anything to do with the union. But, under the policies now dominant in Washington, to give them this honest advice is iniquitous—worse than that, it is coercion. President Roosevelt and General Johnson both have implied that it is coercion. Yet if the labor union organizer from the city hits the worker over the head with a wrench to intimidate him into signing a union card, that apparently is not coercion in the Washington view.

At present, this disconcerting state of affairs is due entirely to the failure of the government to interpret Section 7a fairly. The Wagner bill, if passed in present form, would compound the injustice by writing it into the law of the land.

* * *

Consider the effort of the iron and steel industry to co-operate with the government in adhering strictly to its code. Because the automobile industry felt that the prices under the code were not fair, one automobile manufacturer has contracted for equipment for mills of his own.

But now comes a report from the federal trade commission declaring that the "Detroit automobile manufacturers have forced the (steel) code authority to approve an arbitrary differential in favor of Southern Michigan."

Consider the commission's view on basing points. In 1924 it condemned Pittsburgh plus—a single basing point plan. From 1924 to 1933 it condoned multiple basing points, apparently in the belief that a dozen or more bases offered consumers a degree of relief from the single base plan. On that reasoning the present system of 57 basing points would seem to be a further step in the right direction.

But such is not the case. The commission declares the basing system under the code is in violation of the Pittsburgh-plus decision.

* * *

With such contradictions arising almost daily in the government's intricate dealings with industry, how can conscientious management function properly? How can intelligent decisions be made when established policies of long standing can be changed overnight without warning?

If the administration would leave the same 52 cards in the deck long enough for industry to get used to them, the new deal might mean more than it does today.

THE INDUSTRIAL DIAL

Published in the last issue of each month as part of
The Business Trend Section of STEEL
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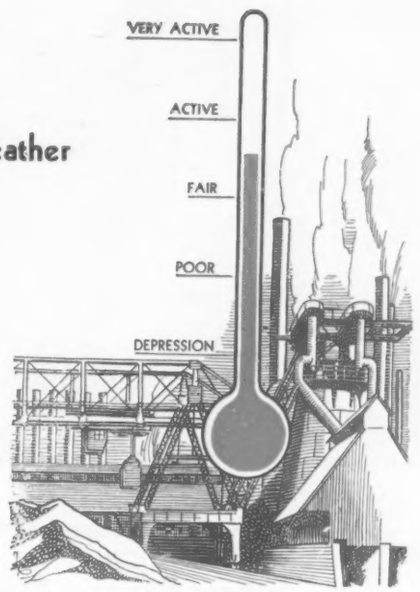
MARCH, 1934, is almost equaling March, 1933, in point of unexpected, momentous, national events. Certain happenings of the past few weeks are almost as important in their effect upon industry as were the crises in the first month of the Roosevelt administration a year ago.

Time may show that the flareups of the month contributed constructively to recovery. Cancellation of air mail contracts, ordered in February, became established in March as a bad administrative error. The experience is likely to discourage impetuous government action in the future. The opposition to the original provisions of the Fletcher-Rayburn bill probably will have a salutary influence upon irresponsible framers of restrictive legislation.

General Johnson's meeting of code authorities in the week of March 5 revealed situations in code administration which brought a fortunate halt to unwise blanket demands upon industry in regard to hours and wages. Finally, the unbelievably unfair features of the Wagner bill have aroused employers so thoroughly that the labor problem—a mess for eight months—may be brought out into the open and clarified.

These events, singly and collectively, have served to remove the camouflage from the new deal and to permit the public for the first time to examine its mechanism critically. It is a wholesome development.

Industrial Weather



TREND:

Upward

Business made many gains during the month. Industrial activity advanced, but the improvement was held in check by strikes and threatened labor trouble, and by uncertainties created by unfavorable tendencies in government policies. Even the capital goods industries showed more signs of life in March than in any month

The Barometer of Business

Industrial Indicators

	Feb., 1934	Jan., 1934	Feb., 1933
Pig iron output (daily average, tons)	45,426	39,537	19,752
Machine Tool Index	104.8	103.6	27.5
Finished Steel shipments (tons)	385,500	331,777	275,929
Ingot output (daily average, tons)	92,696	73,959	45,286
Dodge Bldg. awards in 37 states (sq. ft.)	.....	9,568,700	7,382,400
Automobile output	*260,000	167.910	110,112
Coal output, tons	31,950,000	32,935,000	27,220,000
Business failures, number	1,049	1,364	2,378
Business failures, liabilities	$19,444,718	$32,905,428	$65,576,068
Cement production, Bbls.	.....	3,779,000	2,772,000
Cotton consumption, bales	.....	508,000	441,663
Car loadings (weekly av.)	577,217	544,390	489,495

*Estimate.

Foreign Trade

	Feb., 1934	Jan., 1934	Feb., 1933
Exports	.....	$172,000,000	$101,515,000
Imports	.....	$128,536,080	$83,748,000
Gold exports	.....	$4,715,000	$21,521,000
Gold imports	.....	$1,947,000	$30,397,000

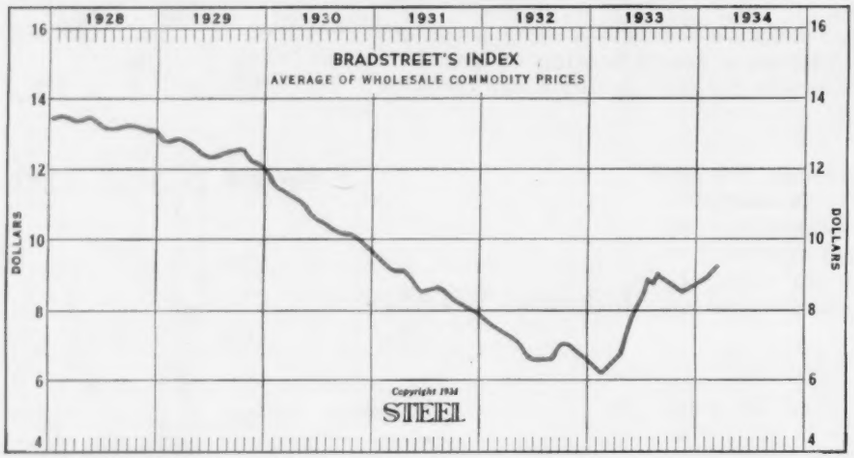
Financial Indicators

	Feb., 1934	Jan., 1934	Feb., 1933
25 Industrial stocks	$148.33	$142.28	$84.55
25 Rail stocks	$41.02	$37.18	$21.43
40 Bonds	$80.59	$76.62	$65.46
Bank clearings (000 omitted)	$19,036,698	$17,740,951	$19,949,176
Commercial paper rate N. Y. (per cent)	1½	1½	1¼
*Commercial loans (000 omitted)	$4,665,000	$4,740,000	$5,393,000
Federal Reserve ratio, per cent	66.3	63.9	55.3
**Railroad earnings	$30,931,205	$37,763,879	$13,585,010
Stock sales, N. Y. stock exchange	56,834,010	54,567,209	19,319,900
Bond sales, par value	$384,503,700	$440,984,700	$231,539,700

*Leading member banks Federal Reserve System.
**January, December and January, respectively.

Commodity Prices

	Feb., 1934	Jan., 1934	Feb., 1933	Monthly av., 1913
STEEL's composite average of 14 iron and steel prices	$32.42	$32.42	$28.31	$26.32
Bradstreet's Index	$9.26	$9.01	$6.35	$9.21
Wheat, cash (bushel)	$1.07	$1.06	67c	92c
Corn, cash (bushel)	66c	66c	40c	51c
Petroleum, crude (Bbl.)	.....	98c	42c	$2.50



	1934	1933
March 1	$9.26	$6.35
February 1	9.01	6.53
January 1	8.83	6.79

for a year, although they still lag far behind the industries in the consumers' goods group.

Impressive gains were registered in employment. Electric power output and freight car loadings mounted rather sharply. The movement of prices continued erratic, although the trend is definitely upward.

The outlook for business improvement in the spring months is promising, except for the retarding influence of unwise government action.

Where Business Stands

Monthly Average, 1933—100

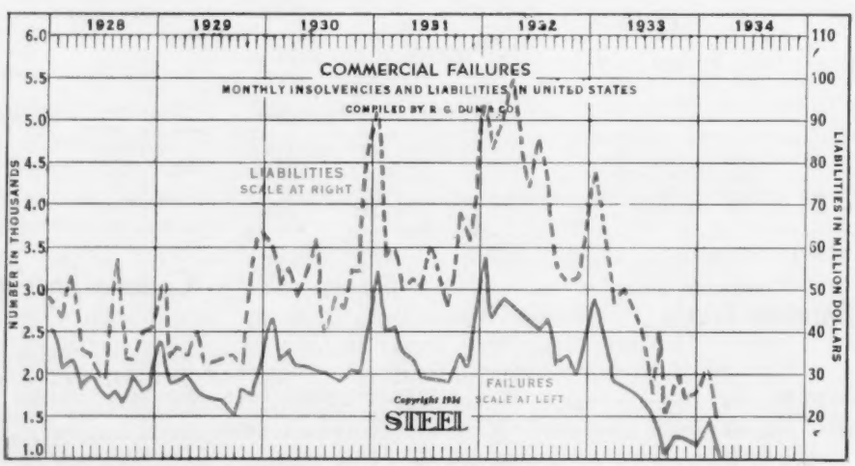
	Feb., 1934	Jan., 1934	Feb., 1933
Steel Ingot Output	125.6	100.2	61.4
Pig Iron Output	125.4	106.1	54.5
Freight Movement	103.6	97.7	87.8
Building Construction	.....	78.1	60.2
Automobile Output	154.1	97.8	65.3
Wholesale Prices	117.8	114.6	80.8

Commodity Price Index Advances 45.8 Per Cent From Year Ago

Bradstreet's index of wholesale commodity prices registered the third consecutive monthly advance and on March 1 stood at $9.26, the highest point since Feb. 1, 1931. The current figure compares with $9.01 registered on Feb. 1 and when compared with $6.35 on March 1, 1933, the present level represents a gain of 45.8 per cent. With the exception of a few minor dips during the Fall of 1933, the index has shown an almost uninterrupted rise since March 1, 1933.

February Commercial Failures Lowest Since 1920

Commercial failures, reported by Dun & Bradstreet, Inc., in February were the lowest in number and amount for any month in fourteen years. During the second month, there were 1049 failures compared with 2378 similar defaults in February, 1933, a decrease of 55.9 per cent. The aggregate of indebtedness reported for defaults that occurred last month was $19,444,718. This compares with $32,905,428 of liabilities recorded for January and $65,576,068 for February, 1933.

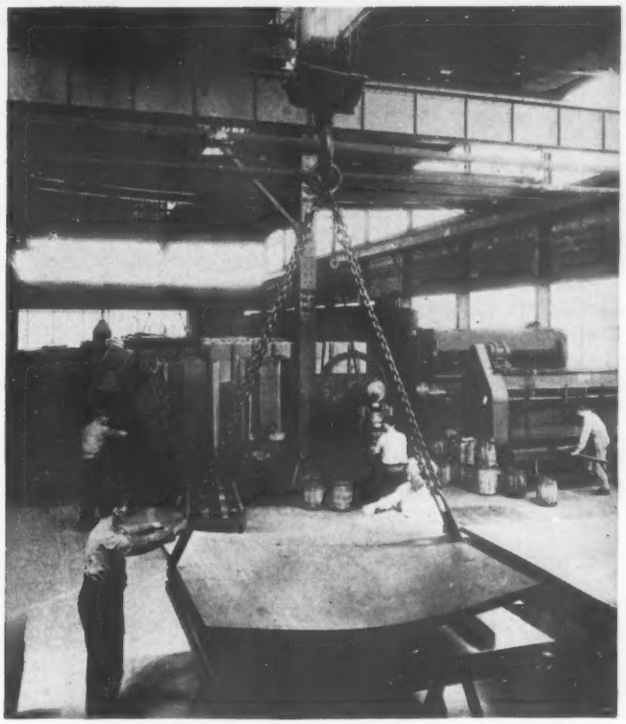


Number	
February, 1934	1,049
January, 1934	1,364
February, 1933	2,378

Liabilities	
February, 1934	$19,444,718
January, 1934	32,905,428
February, 1933	65,576,068

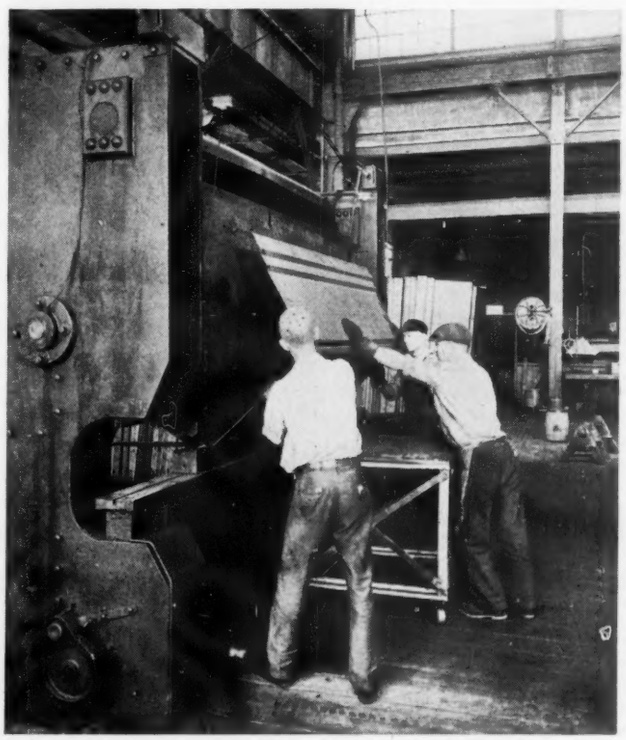
WELDED BURIAL VAULTS IMMUNE TO WATER AND RUST

BY A. H. ALLEN
Associate Editor, STEEL



Unloading flat plates and stacking preparatory to forming top and sides of vault. Resquaring shear is in the right background

PERMANENCE of finish, strength, beauty and reasonable cost are goals which manufacturers of metallic burial vaults have been striving to attain. Lately, noteworthy progress has been made in the development of vault design, perfection of lasting finishes and application of rust-resisting treatments to the metal from which vaults are fabricated. At the same time, the feature of economy has been kept in mind continually, with the result that these vaults are more widely available to people of moderate means confronted with funeral expense.



Forming contour of the top and sides in a 50-ton brake

A leading manufacturer of burial vaults is the Sozonian Vault Co., Bucyrus, O., a company which has adapted modern fabricating methods and finishing treatments to the manufacture of its product. Standard vaults made by this company are of Armco ingot iron and Keystone copper-bearing steel sheets, which are supplied by the American Rolling Mill Co., Middletown, O., and the American Sheet & Tin Plate Co., Pittsburgh, respectively.

Surfaces of these sheets are protected by a thorough bonderizing treatment and application of either porcelain enamel, hot dip galvanizing, or a baked oil paint, the latter providing an unusually hard, resistant and striking wrinkle finish.

The vaults comprise a bell or top and a base to which the bell is fastened by four spring latches before lowering into the grave. The bell itself is made of three pieces—the two ends and the central piece comprising top and sides—assembled by oxyacetylene welding on the outside and electric welding on the inside. The bell and base of vault are fabricated from 12-gage metal. The standard size weighs 445 pounds.

Protection against the danger of water passing into the bell after interment is accomplished by making the bell air tight. The resulting air pressure effectively prevents admission of

water. Further protection is furnishde by a supplementary air seal formed by the lower edges of the bell, these being bent over 90 degrees and crimped in V-shape to form this auxiliary seal.

Iron and steel sheets are received cut to approximate size. The first operation is to run them through a resquaring shear to insure correct size. The next operation is to form the contour of the sides and the supplementary air seal at the lower edges, this being accomplished in a 50-ton brake. End pieces are resquared and mechanically shaped and die cut in a 180-ton press.

The central piece is transferred to a hydraulic press equipped with three rams, where it is placed upside down and the contour of the top formed as the rams descend. This brings the sides up to right angles with the top. The ends are then set in position and tack welded. So closely are the pieces shaped and cut that an extremely close fit is assured. Studs for mounting handles and hardware are welded to the outside and do not penetrate the sides of the vault.

The unit then is removed from the press and placed on a welding rack, where the two seams at the ends are welded on the outside by oxy-acetylene torch and along the interior by electric arc. The purpose of this dual welding is to insure absolute air tightness through elimination of any danger of weld porosity.

To test air tightness, the vaults are loaded right side up and one at a time upon a platform where they are locked into position and submerged in a tank of water, the platform being lowered by an electric motor drive through a rack and pinion arrangement. Any imperfections in workmanship or materials are plainly revealed by air bubbles rising to the surface.

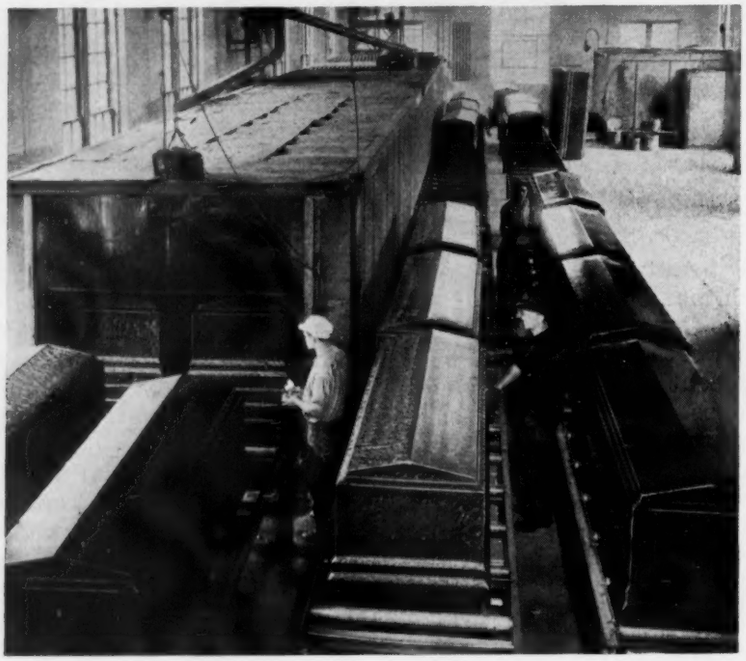
Following this hydrostatic test the vaults are given the bonderizing treatment. They are lowered, four at a time, into a tank of bonderite solution, held at a temperature of 212 degrees Fahr. by means of steam coils. The vaults are placed partially on their sides to facilitate submerging. They remain in the solution about 15 minutes and are removed and placed in a boiling water rinse.

Bonderite solution, it will be recalled, is a nonacid liquid, containing a cleaner, copper sulphate and manganese phosphate. Its action is first to clean off dirt and grease and then to deposit a crystalline layer of sulphate and phosphate upon the metal. This deposit is closely adherent and entirely rust resistant, to a certain extent penetrating into the metal itself. It is an ideal treatment preparatory to enameling or application of other types of finishing materials and is used widely in the automotive industry on parts subjected to corrosive attack. Used on burial vaults, it is claimed to increase the life of the metal as much as seven or eight times.

The vault is then moved to a spray booth where an operator sprays the interior with a terracotta enamel. The exterior is sprayed with a special type of preparation, which after being baked forms a hard wrinkle finish. This type of finish was discovered by accident some years ago when a combination of atmospheric conditions and temperature in the baking oven resulted in the smooth enamel emerging in a tough, uneven finish which appeared as if the enamel had sagged over the surface in hardening. The appearance was so attractive that experiments were conducted to determine the exact conditions of producing this type of finish which is now standard.

The wrinkle finish material is a mixture of china wood oil, asphaltum and varnish gums, especially prepared for this work. The wrinkle effect is produced primarily by the hardening of the china wood oil. It was developed in co-operation with research laboratories of Ohio State university, Columbus, O.

The baking oven is about 60 feet long and accommodates 16 vaults, carried through sidewise on a continuous conveyor. Temperature is maintained at 325 to 350 degrees Fahr. by means of electric heating elements mounted on the sidewalls of the oven. The atmosphere contains a deficiency of air. Each vault is baked for a period of one hour and 45 minutes.



Discharge end of 60-foot baking oven. These vaults have the wrinkle finish mentioned in the text

Finished in Colors

Finally, a metallic color coat is applied over the exterior—silver, gold, green and rosebloom being standard colors. The vaults are then assembled with the bases and first covered with heavy Kraft paper and then a thickness of heavy fiber board. A wooden skid is placed on the bottom and this is fastened securely with steel strapping.

Bases likewise are formed from 12-gage iron or steel, with the central part raised about 3 inches from the edges, so that the bell section fits over it securely. A flange around the edge is the bearing plate for the supplementary air seal edge of the bell. Four spring locks are welded to the base to lock with the bell. These locks are manipulated from outside the base and beneath it. If it is desired to insure against tampering after interment, wires connected to the locks are snipped off and it is impossible to open the vault without removal from the grave and the vault burned open by torch.

As mentioned previously, the vaults may be obtained in a porcelain enamel finish as well as in the baked wrinkle finish. In developing a suitable design for enameling, it was found that at the temperature of baking—1700 degrees Fahr.—the vault was likely to buckle and warp along the sides and top. Therefore, a new design was evolved which is now standard with the porcelain enamel style and optional with the wrinkle finish. The top was arched to provide additional strength and the sides and ends were formed in such a way

that the contour resembles an I-beam channel. This arrangement reinforced by the stiffening effect of the supplementary air seal around the lower edges of the bell, gave sufficient strength to the metal to prevent any warping during porcelain enameling. Other designs, known by such names as Colonial and Gothic, continue to be made, but not in the porcelain finish.

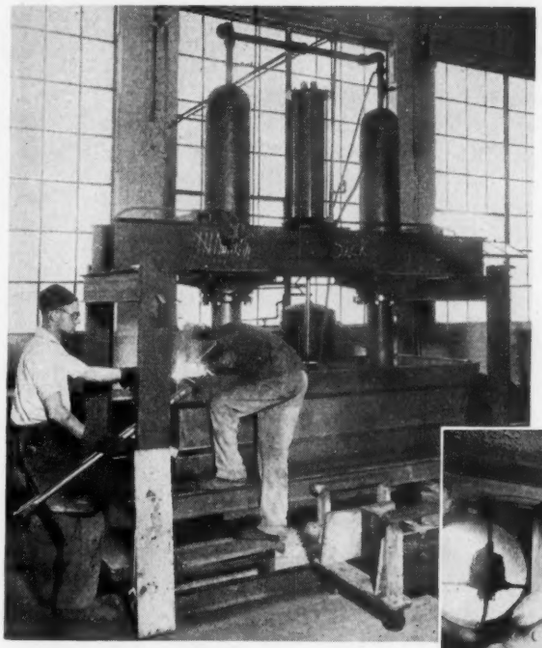
Permanency of these two types of finishes has been demonstrated by inability to chip the metal off, either by hammer, handling chains, or accidental dropping. In fact, one of the wrinkle finish vaults was disinterred after three years and appeared to be in just as good condition as the day it was buried, no deterioration of any sort being evident. The case is related of an undertaker who had five of the wrinkle finish vaults stored in his establishment which later was practically destroyed by fire. The vaults fell through from the second floor to the basement, but after being washed off with water, were undistinguishable from new vaults.

Numerous other materials, including aluminum and copper, have been used in an experimental way and are available upon demand.

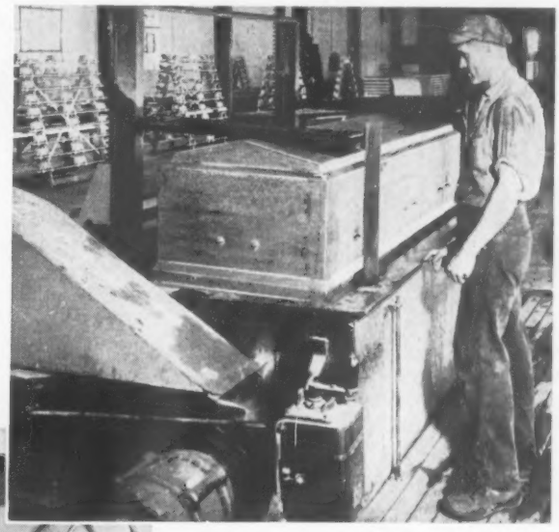
Handles and other hardware on the vaults are of cast malleable iron, and replace light steel stampings.

Status of Flame Cutting, Machining Surveyed

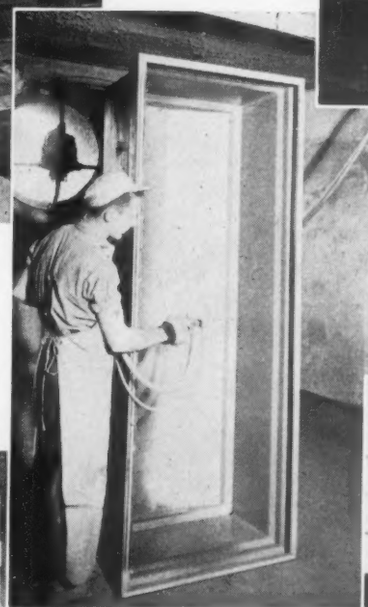
Comprehensive review of the present development of the art of machine cutting and flame machining by the oxyacetylene process is published in the February issue of the *Journal of the American Welding Society*. The article, replete with tabular material and illustrations, was prepared by Richard F. Helmkamp, applied engineering department, Air Reduction Sales Co., New York. Speed and flexibility of the two processes are emphasized, as well as economies which their use makes possible.



HYDRAULIC press is shown above in which arched top is formed and the end pieces tack-welded in place. Below is the welding rack on which end joints are oxyacetylene welded on the outside and electric welded on the inside

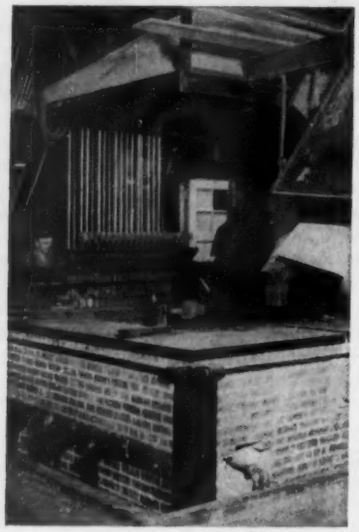


TO INSURE air tightness, each vault is tested hydrostatically, being locked in a rack and submerged in a tank of water, as shown above. The bottom of the vault is open in this test. At the left, an operator is spraying the interior of a vault with terracotta enamel



AT THE right four welded vaults are being lowered into the hot rustproofing solution from which they are removed after 15 minutes and rinsed in the adjacent tank

Making the Most *of* METHODS AND MATERIALS



Welding Has Negligible Effect on Galvanizing

GOVERNMENT navy yard tests conducted on electric arc welding of galvanized steel plates have led to several interesting conclusions. In plating ½-inch and thicker, normal welding on one side will not burn off the galvanizing on the other side. The corrosion resistance of plating from which the galvanizing apparently has been burned off by the heat of welding does not seem to have lessened in any great degree. The zinc coating is completely burned off only along a very narrow zone at the toe of the weld; the zinc is melted at a considerable distance from the weld, but the protection of this melted zone is not impaired. Covered electrodes burn off the zinc to a greater extent and to a greater distance from the weld than do bare electrodes, but only to a small degree. In general, it appears that the effect of welding on galvanizing can be considered negligible and that the effect of the galvanizing on the welding is of little practical importance. The real problem is the protection of the health of the welders. Breathing of the zinc or zinc oxide fumes for even relatively short periods causes "welders' ague."

$ $ $

Thin-Walled Carburizing Boxes Advantageous

Advantages of thin-walled carburizing boxes are generally recognized. Construction of a very satisfactory type is a thin casting for a bottom to which is welded ⅛-inch sheet or cast sides, more or less corrugated for stiffness. A thin cover casting completes the job. Well-made analyses of the 35 per cent nickel, 15 per cent chromium type have been found to be almost everlasting as far as scale resistance is concerned, if sodium compounds which attack high chromium alloys are excluded from the carburizer. Boxes of this type fail by warpage—the top opening gradually changes from a rectangular to an hour-glass shape—and the material gradually absorbs carbon to become so brittle that the sheets cannot be straightened out. One help is to weld a fairly stiff beading around the top edge.

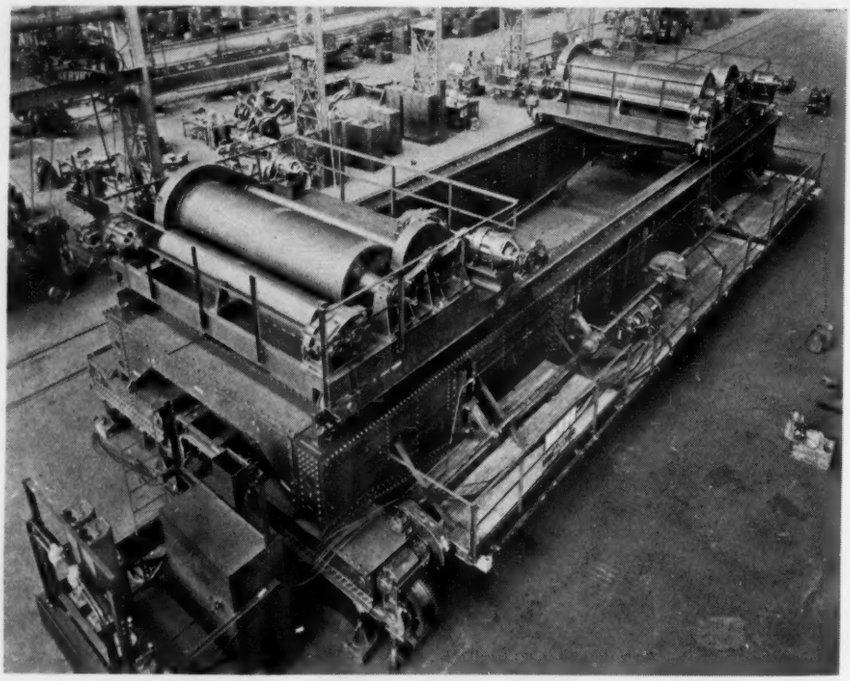
$ $ $

A double operation by the same blowpipe is being carried out in the fabrication of woven wire belting. As first fabricated, the belting is in 36-inch widths. Simultaneously these widths then are cut and the wire strands of each cut edge welded by the same oxyacetylene flame into 2-inch strips. This is accomplished by a very careful blowpipe adjustment so that the flame carries just the right excess of oxygen.

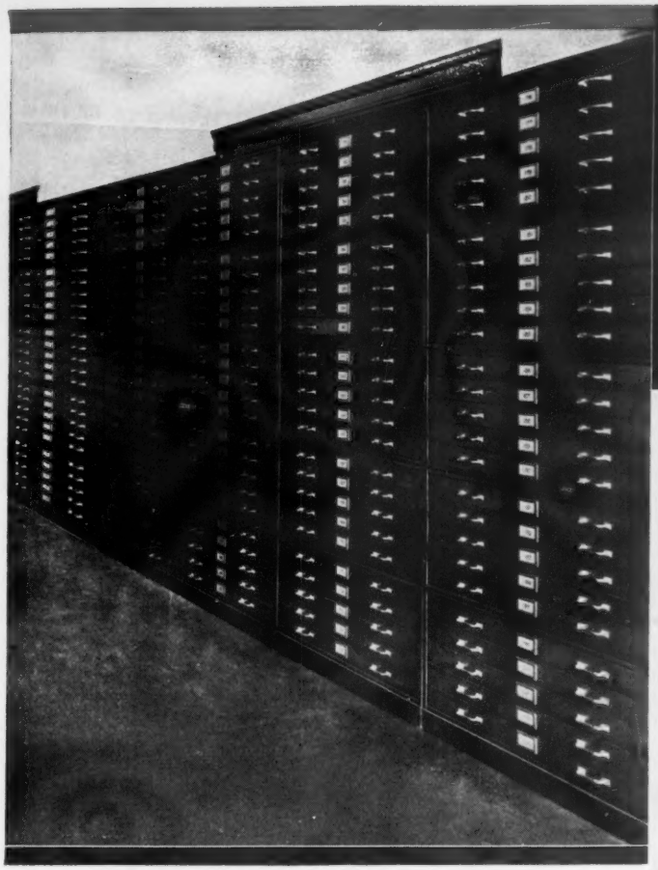
$ $ $

Need Proper Lubrication In Thread Cutting

FRICTIONAL heat of threading and tapping depends upon the nature of the metal, the size of tap or chaser and the speed of cutting. Since radiation is relatively difficult, adequate lubrication and proper cooling are extremely important to prevent tearing of the thread. Use of correct cutting oil is necessary to perfect thread cutting and results in



ONE OF FOUR GIANT CRANES FOR BOULDER DAM: This 300-ton traveling crane, one of four recently awarded to the Harnischfeger Corp., Milwaukee, by the government for installation in the power house at Boulder dam, is of the double-trolley type having a span of 64 feet and a lift of 70 feet. Eight electric motors, with combined horsepower of 380, are used in the bridge drive, the hoist and hoist propel mechanism. Truck bodies and trolley frames are of welded construction. Two of these units will be installed in each wing of the power house for handling huge generator rotors, the latter being 26 feet in diameter and weighing 60 tons. The units will be dismantled for shipment to the dam and lowered to the floor of the power house 600 feet below the 150-ton cableway which spans the canyon. In addition to these 300-ton units, the contract also included a 50-ton crane for miscellaneous work; the five involve expenditure of about $250,000



For FINISH· INLAND COLD ROLLED Sheets

● *Above:* Filing Cabinets made of Inland Cold Rolled Sheets.

● *Right:* Inland Cold Rolled Sheets are used for unusually attractive steel card tables.

In producing sheets with unusual perfection of finish, rolling equipment is a vital factor. With the best available equipment skilled workmen can reach new heights of skill—without it they are handicapped.

The importance of equipment explains why so many manufacturers of products in which finish is important are now coming to Inland for their sheets and strip. Inland's new sheet and strip mill incorporates the most modern developments and refinements in rolling equipment.

To release the skill of your workmen in producing beautifully finished products, use the Inland mill as your source of supply for Furniture Sheets, Auto Body Sheets, all grades of High Finished Sheets and Strip. INLAND STEEL COMPANY, 38 So. Dearborn St., Chicago, Illinois.

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INLAND STEEL

ABLE SERVANT OF THE CENTRAL WEST

Sheets Strip Tin Plate
Plates Structurals Piling

Rails Track Accessories
Bars Rivets Billets

fewer rejects and increased production. On certain automatics using expanding chasers and collapsible taps, proper lubrication prolongs the life of these very expensive tools, and the complete flushing of the chips prevents stalling of the automatic action of the taps or dies.

$ $ $

Porcelain enameled steel, which affords a wide range of decorative possibilities, is being suggested for residence fireplace construction. Several designs have been prepared. In one, the porcelain enamel is used much as a marble facing, framed with a polished metal band. The variety of textures and colors available in enamel would make this design widely adaptabe. A second type, inspired by colonial tradition of New England, features simple, classical lines to make an interesting background for a pictorial panel which would be executed in full color. A third style, for more formal rooms, incorporates the use of embossed patterns and color combinations. It is pointed out that in stock patterns, fireplaces and other decorative elements could be marketed at very reasonable prices.

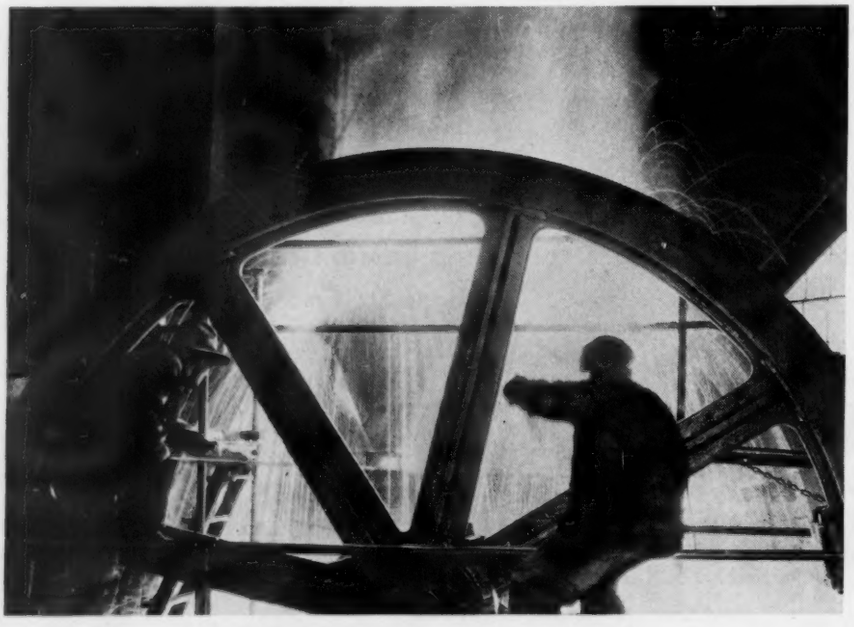
$ $ $

Thermit Weld Restores Cable Railway Driveshaft To Service Quickly

WHEN the main driveshaft at a power house of San Francisco's Market Street Railway Co. let go recently, three street car lines were tied up completely. The break occured at 3:30 o'clock on Saturday afternoon. To obtain a new shaft and install it would have taken weeks and would have meant a complete shutdown during that time.

A Metal & Thermit Corp., representative was called and a crew was recruited from the railway's track welding gang. Preparation for welding was under way by 5 p.m. and the night was consumed in preparing the fracture and assembling the welding equipment and materials. Preheating required until mid-afternoon on Sunday, when the weld was poured. By midnight the metal had cooled sufficiently to permit stripping off the molds, and, by 3 a.m. Monday the job was completed. This was in ample time for cars to start running on their regular Monday morning schedules.

The shaft which fractured is 18½ feet long. It has a large drive gear in the center and a cable drum at each end and one each side of the drive gear. The break occurred at a shoulder of the drive gear seat and bearing where the diameters are 10½ inches and 13½ inches. The repair was made with the shaft in place and required a minimum of dismantling. The results, aside from the speed with which the job was done, were remarkable in that after welding, the shaft was less than 1/32 inch out of alignment—less out of line, in fact, than it had been before. The repair is, of course, a permanent one and the shaft may now be considered as strong and as sound as new.



The Thermit reaction—welding main drift shaft at cable drive power plant of Market Street Railway Co., San Francisco

Preheating Makes Flame Cutting More Economical

Most high-carbon and alloy steels can be flame cut when the preheating and slow cooling of the metal are carried out. Preheating also tends to reduce the quantities of gases and time required, making a considerable saving. This last holds for low-carbon and medium steels as well. Flame cut surfaces of high-carbon and alloy steels are smooth and when suitably preheated just before cutting are similar in quality to the unaffected material. Parts that are to undergo high repeated or reversing stresses on an exposed cut surface can be satisfactorily cut provided proper set-up of apparatus is made to insure a smooth regular cut with no indentations. If not, the exposed cut edge should subsequently be planed or machined if possible in the same direction in which the stress will flow.

$ $ $

Automobile Body Dies Are Cast from Alloy Iron

It has been the custom for one large automobile builder to cast large forming dies, such as for fenders, body sections, and the like, from ordinary gray iron, and when they become worn to remove them to the die room where the worn parts were replaced with inserts of alloy die iron. After a cost analysis was made, however, it was found to be more economical to cast the entire die of alloy iron, thus saving the machining necessary to set in the inserts.

Welds Forged Crankshafts

A New England textile loom builder, having a demand for looms of various weaving widths, keeps in stock drop-forged crankshafts of short lengths and electrically butt welds an additional length of shafting to the original standard stock as demand for various loom widths arises. In the butt welding of this shaft, the welded section passes twice through a bulldozer and is mushroomed and trip hammered. The welded section tests stronger than the original pieces of shafting. This operation eliminates the forging of an individual shaft for each loom.

EMPIRE ELECTRICAL SHEETS

Uniformity, in electrical and mechanical characteristics, is a quality sought for in the production of electrical equipment. EMPIRE electrical sheets assure this uniformity, and consequently reflect this quality in the completed product. Guarantee the efficiency of your finished unit by using our interpretation of the best in electrical sheets as a base product.

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EMPIRE STEEL SHEETS

Some of these dies, weighing 6 to 8 tons, are too large to heat and quench with the usual equipment, consequently excellent results are obtained by stiffening up the alloy composition. A typical analysis contains 3.00 total carbon, 1.45 silicon, 0.90 manganese, 3.00 nickel and 0.90 per cent chromium. Dies of this composition are allowed to remain in the mold until they have cooled completely before shaking out, with a resulting hardness of 280-300 brinell. Considering this hardness, machinability, while somewhat less than for ordinary gray iron, is very good.

Large Plates of 18-8 Clad Steel Are Used in Building Rotary Dryer

SINCE the comparatively recent introduction of stainless-clad steel, its use has been increased rapidly by manufacturers of equipment because of its economy and corrosion-resisting properties. Recently, some of the largest stainless-clad steel plates ever produced in this country were supplied by the Ingersoll Steel & Disc Co., Chicago, for the fabrication of a large rotary dryer built by the C. O. Bartlett & Snow Co., Cleveland. The dryer, to be used in the chemical industry, is 72 inches in diameter and 35 feet long.

Eight plates, 4 feet 8⅝ inches wide and ¼-inch thick, were used, four being 20 feet and the others 15 feet long. The 18-8 stainless layer, approximately 0.050-inch thick, or 20 per cent of the total plate thickness, was on the inside as the plates were rolled to form a cylinder.

Joints were made by electric arc welding. At the transverse and longitudinal joints the mild steel exterior portion of each plate was welded together with coated steel rod and reinforced with a mild steel butt strap also welded with this rod, the latter furnished by Babcock & Wilcox Co., New York. The stainless cladding was connected at the joints by electric welding, using a 24 per cent chrome, 12 per cent nickel coated alloy steel rod, supplied by the Page Steel and Wire Co., Pittsburgh.

End retainer plates of solid 18-8 stainless steel produced by the Allegheny Steel Co., Brackenridge, Pa., were secured by stainless steel angle rings and rivets driven hot. The discharge end retainer plate was fitted with several removable door plates, held fast with stainless steel bolts and nuts.

Cast-iron sealing rings at each end of the dryer, where the cylinder enters the breechings, were protected by stainless-clad plates, welded together and riveted to stainless angle rings. To insure no ordinary steel surface contacting the material processed, the mild steel exterior of the cylinder was covered with 18-8 steel sheet, the edges of which were swedged over the ends of the cylinder plates and welded to the stainless cladding. Seal rings, riding rings, girt gear and rapping cams were fastened to the cylinder by 18-8 steel bolts, supplied by the Republic Steel Corp., Youngstown, O.

With the dryer was supplied a rotary cooler, 60 inches in diameter and 30 feet long, made of ¼-inch heat treated aluminum alloy plates, produced by the Aluminum Co. of America, Pittsburgh. The inside of the cooler was fitted with lifting flights of aluminum alloy, and subsequently heat treated before being riveted in place.

Breechings of both the dryer and cooler were made entirely of 18-8 stainless steel, all joints being arc welded. Specially treated asbestos brake lining, produced for this particular service by the Southern Asbestos Co., Charlotte, N. C., closed the opening between the rotating seal ring on the end of the dryer or cooler cylinder and the breeching face. Due to the nature of the stock to be dried and cooled, pure nickel was used instead of the ordinary interwoven brass wire insertion.

Both the dryer and cooler are driven from individual electric motors, through herringbone reducers, manufactured by the Falk Corp., Milwaukee. This company also furnished the flexible couplings connecting the motors to the reducers, and the ring oiling outboard bearings which support the slow speed shafts of the reducers.

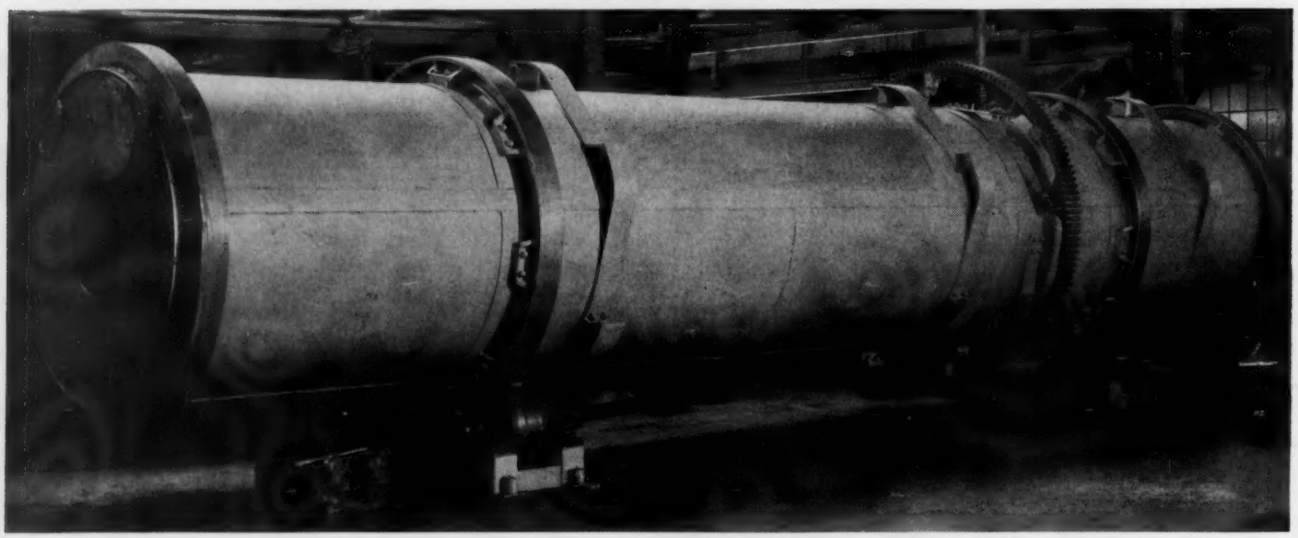
The installation is designed so that no surface is exposed to the stock being processed, except stainless steel or aluminum alloy, thus insuring a dried stock of high chemical purity.

SOME of the largest stainless-clad steel plates ever produced were used to build this rotary dryer. Joints were made by electric arc welding and no surface is exposed to the stock being processed except stainless steel or aluminum alloy

Booklet Illustrates Uses Of Nickel-clad Steel

Applications of nickel-clad steel in the process industries are illustrated and described briefly in a booklet just published by the Lukens Steel Co., Coatesville, Pa.

Although this clad metal has been



ADVERTISING PAGES REMOVED

available commercially only during the past two years, it has had wide application in heavy plate construction because of its economy and corrosion-resistance. It is a bi-metal, made by a hot rolling process, with a surface of pure nickel permanently bonded to a steel base. The metal has a nominal tensile strength of 55,000 pounds per square inch, and high heat conductivity which provides maximum thermal efficiency in heat transfer equipment.

The 12-page booklet contains many illustrations of equipment fabricated from nickel-clad steel; data on the material; its shapes and finishes available; and a list of distributors who maintain warehouse stocks.

Milled Nuts Show Type of Thread

COLD-DRAWN hexagon steel bars, produced by Moltrup Steel Products Co., Beaver Falls, Pa., and sold for nut stock, now are being offered with one side imprinted with the letter "R" or "L" to designate right-hand or left-hand threads in the finished milled nuts. A nominal extra charge is made for the bars so marked.

The rolled letters are so closely spaced that a nut of less than ½-inch thickness will show the type of thread clearly. Two ¾-inch bars and nuts milled from them are shown in the accompanying illustration.

Advantages of this marking are the ease in sorting, should right and left-hand threaded nuts become mixed in stock, and the facility in distinguishing the turn of the thread of a nut in service.

According to present plans, the company in the near future may similarly mark its bars to indicate the analysis of the steel. This marking would be in the form of a stamped or rolled imprint, rather than the color-painting practice used widely today on the ends of the bars.

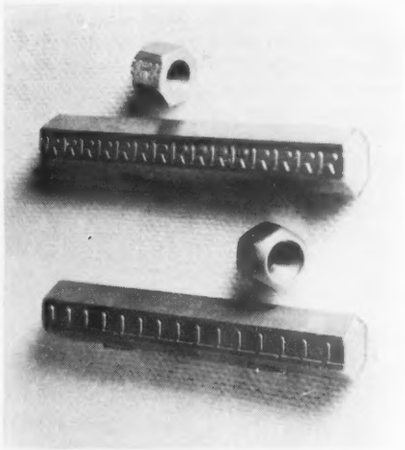
Arc Welding Handbook Made More Comprehensive

Procedure Handbook of Arc Welding Design and Practice, semiflexible simulated leather, 450 pages, 5¾ x 9 inches; published by Lincoln Electric Co., Cleveland; supplied by STEEL, Cleveland, for $1.50, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

Heavy demand for this work has exhausted the edition printed last fall and it has been revised and enlarged to meet continued inquiry. New features included in this edition are: Weld inspection; study of stress distribution by polarized light; simplified method for design of arc welded machinery; procedure and speeds for arc welding aluminum; technique and speeds for welding of copper; construction of welded water lines.

In addition to its value as a practical guide to welding it serves as handy reference work for estimators. Complete welding speed tables aid in estimating welding costs. It is designed especially for use of designers, engineers, welding operators, welding foremen and engineers responsible for design of products which may possibly be redesigned for welding construction.

It includes descriptions of various welding processes, definitions of welding terms, classification of welds, strength of welded joints, methods of stress relieving, tabulations of speed of welding all types of joints in all positions, methods of estimating cost of weld production, structure and properties of weld metal, specifications for steel and alloys of good weldability, welding of nonferrous metals, comparison of limitations of rolled steel and cast iron in machine design, construction details of basic welded machine parts, fundamental advantages of arc welded and riveted steel structures, welding of automotive parts, use of arc welding in various industrial plants and other subjects.



By marking these cold-drawn steel bars with the letters "R" or "L," nuts milled from them indicate right or left-hand threads

Manual Covers Arc Welding Process and Its Uses

Such facts about the electric arc welding process as are essential to its successful application are presented in an 80-page "Manual of Simplified Arc Welding," published by the Hobart Bros. Co., Troy, O. This manual, first compiled in 1930, has been issued in a new edition each succeeding year.

The text consists of a brief, nontechnical explanation of arc welding. It covers the practical application of the process and is written so as to be understood by those with little technical training.

Nine chapters, well illustrated with sketches and halftones, are devoted to the welding arc, equipment, types of joints and welds, weldability of metals, choice of electrodes, metallic and carbon arcs, operating instructions and the speed and cost of arc welding.

Supplementary sections include examples of arc welding in a wide range of industries, equipment manufactured by the company, and an alphabetical index.

Study Hardness Test Specimens

MINIMUM dimensions of test samples for brinell and diamond pyramid hardness tests were reported upon in a paper presented before the twenty-sixth general meeting of the British Institute of Metals in London, March 7-8. The investigation, conducted by Dr. G. A. Hankins and C. W. Aldous, National Physical Laboratory, Teddington, is of particular importance in regard to brinell tests on bars and thin plates and to both brinell and diamond pyramid hardness tests on sheet and strip materials.

The metals investigated include copper, brass, aluminum and steel. It is concluded that a width of test-specimen of 4½ times the diameter of the impression is satisfactory for accurate brinell tests on all the materials examined. In regard to the thickness of samples for brinell tests, the limiting value of the ratio of thickness of test sample to depth of impression for accurate results appears to be a characteristic of the test material; a value of the ratio of 6 is required for mild steel, about 15 for copper, and more than 20 for spring steel.

In carrying out diamond pyramid hardness tests on thin samples, a limiting value of the ratio of test-sample thickness to impression diagonal of 1½ gives results which are practically independent of test sample thickness for the majority of sheet metals, with the exception of soft copper and soft brass.

Dr. H. Moore, director, British Nonferrous Metals Research association, was elected president of the institute to succeed Sir Henry Fowler. Vice presidents were named as follows: W. R. Barclay, London; Prof. C. H. Desch, Teddington; A. G. C. Gwyer, Warrington; Prof. D. Hanson, Birmingham; H. C. Lancaster, London; and E. L. Morcom, Birmingham.

Solid Stainless Steel Drum Has Flash Welded Seam

STAINLESS steel barrels, recommended for the shipment of beer and widely used for this purpose in some foreign countries, are being supplied to the Coca-Cola Co., Atlanta, Ga., for shipment of the company's syrup to bottling plants. With capacity of 55-gallons, the barrels are of solid 16-gage low-carbon 18-8 chrome-nickel steel, flash welded and reinforced with I-bar rolling hoops. An order for 1000 of these containers was placed recently (STEEL, Jan. 22, p. 13) with the Stevens Metal Products Co., Niles, O., the steel being supplied by the Republic Steel Corp., Central Alloy division, Massillon, O. Details of the fabrication of these drums have been supplied by E. D. Thompson, vice president of the Stevens company.

The first operation is roll forming the shell from flat plate. The seam is then flash welded as shown below in the illustration at the right. The welding operation is entirely mechanical and a flexible time-control mechanism is used. Low-carbon content of the steel minimizes the danger of carbide precipitation and subsequent intergranular corrosion in the vicinity of the weld.

The weld flash is trimmed off, leaving a narrow, neat seam as shown in the illustration of the barrel below. Soundness of the weld is tested in a special machine which closes the ends and applies 15 pounds air pressure to the interior. The weld is covered with soapy water to reveal any leaks. Any oxide remaining on the steel from the welding operation is next removed by a passivating treatment, following which the shell is washed in hot water and thoroughly dried.

Rolling Hoops Are Plated

Rolling hoops are now attached. These hoops are of low-carbon steel I-bar section, formed, flash welded, sized and flattened, after which they are cadmium plated. The hoops are placed over the shell and the latter is placed over an expanding machine which throws up two beads, one on each side of the I-bar, and at the same time expands the shell so that it is forced tightly against the bottom face of the I-bar. A flanging machine turns over the end of the shell simultaneously, preparatory to attaching the heads. The side opening is next inserted in the shell and a second air test is given the shell, to insure that the side seam has not opened in any place and that the side bung is air tight.

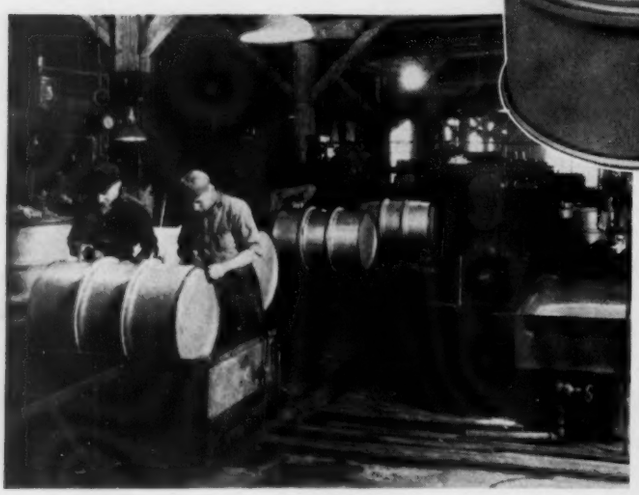
Heads, also of 18-8 steel, are attached in the machine shown in the background of the illustration to the left below. Heads are attached by what is termed a double seaming method, using a chime reinforcement section, the latter of cadmium plated medium carbon steel. By double seaming alone, five thicknesses of metal are provided around the rim of the head; with the chime reinforcement, two additional thicknesses are furnished. A final test under 15 pounds air pressure is made, with the side seam under 3 inches of water. After drying and thorough inspection, both inside and out, the barrels are ready for shipment to the customer. Net weight of each barrel is 92 pounds.

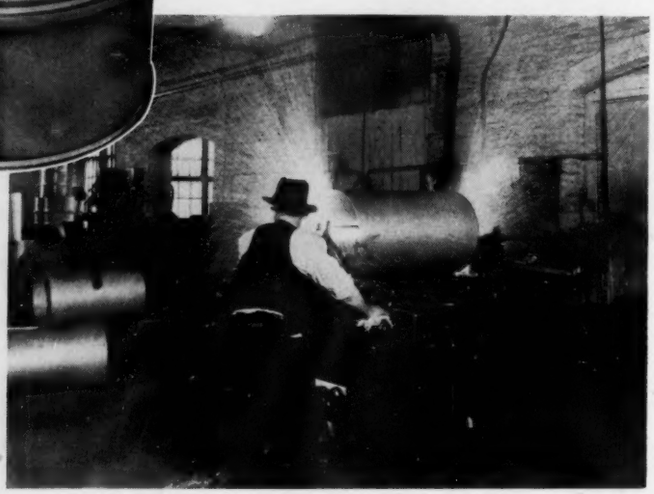
Air pressures used in testing comply with interstate commerce commission regulations, minimum pressure being specified at 15 pounds per square inch. In actual tests this pressure runs up as high as 20 pounds. One of the drums also was given a special hydrostatic test by the manufacturer, at a pressure of 40 pounds per square inch.

Heads are embossed with number of the barrel, name of the owner and "I. C. C. 5," the latter in accordance with the commerce commission's shipping container specification No. 5. In addition to the side outlet, heads also are provided with bung fitting. As mentioned previously the barrels hold 55 U. S. Wine gallons, plus the usual 2 per cent outage.

SOLID stainless steel drum of 55-gallon capacity for shipping Coca-Cola syrup, shown at right. Below, in background is machine for assembling heads to shell by double seaming. In foreground, assembled drums are being tested under 15-20 pounds air pressure, one of three tests made on the barrel during its fabrication

SHELLS, of 16-gage 18-8 chrome-nickel steel are being flash welded in the foreground of the illustration below. Welding is entirely mechanical, with flexible time-control mechanism on the welder. In background is machine for trimming flash off weld. Stripper polishes surface slightly on either side of weld, as shown at the left





UNIFORMLY

FREE FROM SCALE

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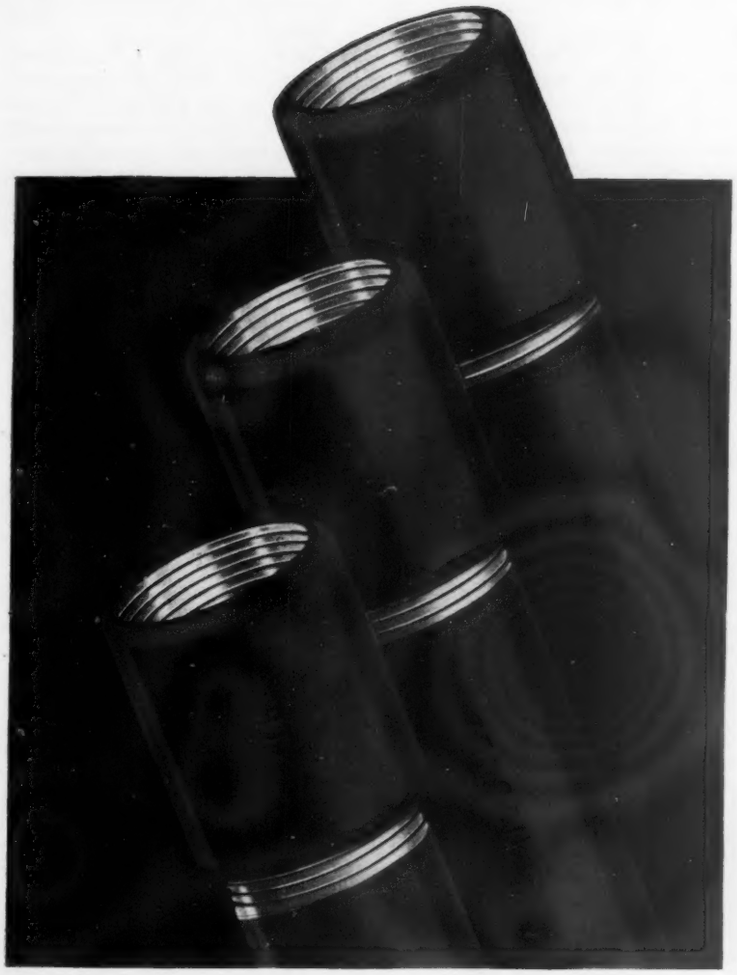
TONCAN
COPPER
MO·LYB·DEN·UM
IRON PIPE



THE claim that Toncan Iron Pipe is free from scale is easily substantiated. All except the very small sizes are produced by Republic's patented process of electric resistance welding. This means that the pipe is made from clean, scale-free, flat strip, and at no time during the forming and welding operations is the metal subjected to a temperature that would form scale. So the resulting pipe is as free from scale as was the strip from which it was made.

In other words, Toncan Iron Pipe is free from scale, not because the pipe has been cleaned or de-scaled mechanically, but because it was made without scale.

This is an important argument in favor of this longer-lasting alloy of refined iron, copper and molybdenum, because everyone is familiar with the fact that scale accelerates corrosion and reduces pipe life.

If you would like to read the story of Toncan Iron Pipe and its proved performance in every type of service, write for a copy of the third edition of "Pipe for Permanence."

REPUBLIC STEEL CORPORATION
GENERAL OFFICES YOUNGSTOWN, OHIO

The Plastic Forming Of Metals

By PROFESSOR DR.-ING ERICH SIEBEL
Translated by JOHN H. HITCHCOCK

Part III—Investigations of Distribution of Deformation and Stress in Technical Forming Processes

1. Condition of Deformation After Forming (Continued)

ATTENTION is directed to another interesting phenomenon which occurred in drawing through the 40-degree die. Figs. 127 and 128 show the bearing surfaces of those halves of the bar which were not originally marked with the co-ordinate network. Whereas the network of lines in all other draws was reproduced on the opposing surface by the pressure in the die, this is the case only at the edge zones in the 40-degree die. This is attributed to the fact that, because of the small effective die area, the effect of pressure does not penetrate deeply, which already has been shown by Pomp, Siebel and Houdremont[35]. Therefore, only the outer zones are deformed by the pressure of the walls of the die, while the central zone no longer is subjected to compressive stress.

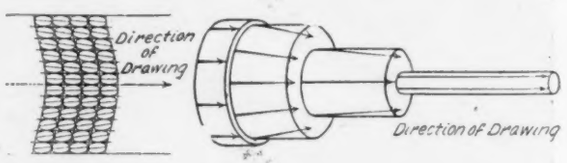
A distribution similar to that of the deformations over the cross section is exhibited also, according to Table XIV, column 5, by the angles at which the ellipsoids of deformation are inclined to the axis of the bar. At the central axis of the bar the inclination is equal to zero, because no additional shear displacements occur at this point. With increasing distance from the axis of the bar, the angle of inclination increases up to a maximum value directly under the enveloping surface. Beyond this point it again decreases. As Fig. 129 shows, the major axes of the ellipsoid of deformation are so directed after drawing that their extensions to the central axis form a cone, the apex of which points in the direction of drawing. The size of the opening angle of the cone increases according to the size of the die angle; its maximum value with the die angles used in practice, however, probably lies at about 12 degrees. According to Table XIV, it is assumed that the angle of inclination remains small even with severe deformations, such as occur in wire drawing.

E. Schmid and G. Wassermann[92] reached similar conclusions on the basis of X-ray investigations on drawn wires of various metals, the deformation textures of which they determined. The texture scheme of a hard-drawn wire, reproduced in Fig. 30, is borrowed from this work. With an opening angle of 18 degrees, the inclination of the fiber axes from the direction in which the wire was drawn was established as zero only in the central zone. In the outer layers, the fiber axes are inclined to the direction of drawing; and likewise in such a manner that they form a cone described around the longitudinal axis of the wire, the apex of which cone points in the direction of drawing (cone-fiber-texture). The highest value of the angle of inclination of a magnesium wire is 9 degrees, and is found directly under the outer surface, from which point outward the amount of the inclination again diminishes. If the positions of the axes of the ellipsoids of deformation are compared with this, it appears probable that a close relation exists between the orientation of the ellipsoids of deformation and the crystal orientations as determined by X-ray examination.

EXTRUSION TESTS. For further investigation of the final deformations, several tests of the extrusion process were carried out. For this purpose, lead bodies were split along a plane of symmetry and were provided with a co-ordinate network. The test specimens were 2.16 inches long and 1.405 inches in diameter, $F_o = 1.55$ square inch; and were extruded by means of a ram from a container of equal inside diameter, through dies having diameters of

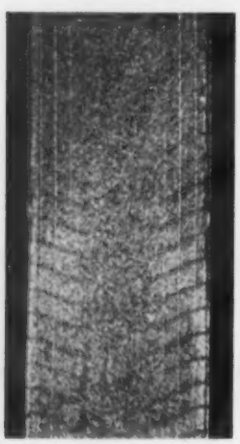
0.996-inch ($F_1 = 0.775$-square inch),
0.814-inch ($F_1 = 0.517$-square inch), and
0.704-inch ($F_1 = 0.375$-square inch).

Figs. 131 to 133 show the alterations of the co-ordinate net work produced in these tests; which were evaluated in Table XVI in the same manner as the drawing tests, because in this case also, elongation occurs with uniform flow of material from all sides in the transverse direction. Evaluation of the outermost edge zone had to be foregone, because in this zone a satisfactory measurement could not be carried out, due to the extraordinarily severe distortions. The total deformations of the ellipsoids over the cross section are plotted in Fig. 134. The attached distorted co-ordinate network, upon which the evaluation was based, is shown for comparison in the lower part of this illustration. In this case also, the total deformations of the individual parts of the cross section increase rapidly toward the edges,



Figs. 127 and 128—Diminution of transverse pressure in center of bar, in drawing with a large die angle (40 degrees)

[92] E. Schmid and G. Wassermann: Uber die Unterschiede in Kern- und Mantelzone gezogener Drahte; Z. Metallk. 19(1927)p.327; —ber die Textur kaltgezogener Magnesium- und Zinkdrahte; Naturwiss. 17 (1929) p. 312.



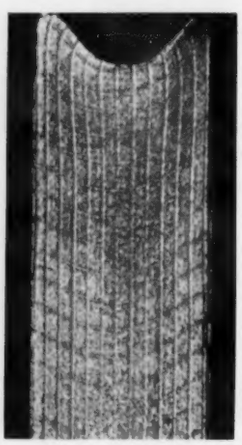


Fig. 129—Ellipsoids of deformation after drawing. Fig. 130—Texture scheme of a hard-drawn wire (according to E. Schmid and G. Wasermann[92])

because of the additional shear displacements which occur in this region.

As in the drawing tests, the angles of inclination in extrusion tests, according to Table XVI, column 5, increase from the central axis up to a maximum value immediately under the enveloping surface, and diminish slightly along the edges. In contrast to the drawing tests, where the decrease is caused by the diminution of the displacement angle, it is attributed in this case to the extremely severe shear displacements in the edge zone. The angles of inclination decrease with increasing deformation. The extraordinarily great displacements, in comparison to those of the drawing tests, are caused by the shape of the die, which has an opening angle of 180 degrees.

Angles of Inclination Increase

PIERCING TESTS. As the third example, the final deformations of a lead block after piercing were investigated more closely (Fig. 135). The test

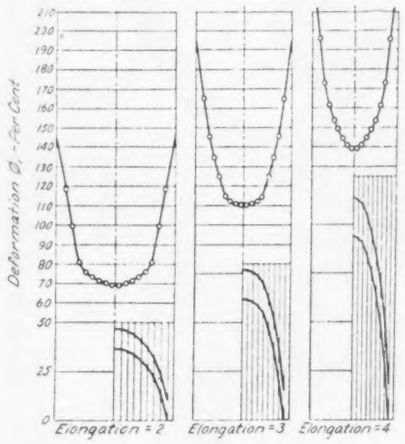


Fig. 134—*Deformation relations in extrusion*

specimen and the container had equal diameters of 1.405 inches. Piercing was done with a flat-faced mandrel of 0.704-inch diameter. The mandrel was guided by a centering ring during the penetration of the material.

If the additional shear displacements are neglected temporarily, the deformation of the bar during piercing occurs as an elongation in the direction of the longitudinal axis, spreading in the tangential direction, and a reduction of thickness in the radial direction. With the help of the co-ordinate network, which was milled in the sectional surface of the longitudinally-split test specimen, these deformations in the individual parts of the cross section could be studied.

If the initial dimensions (before deformation) of a square of the scribed co-ordinate system are designated as b_o and l_o respectively, the radial change of thickness

$$\phi_r = \log_e \beta = \log_e \frac{b}{b_o}$$

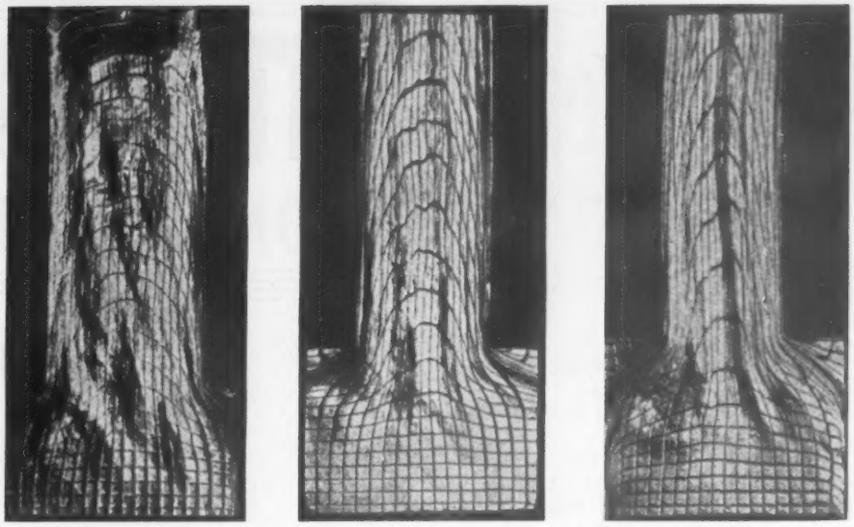
and the elongation

$$\phi_l = \log_e \lambda = \log_e \frac{l}{l_o}$$

can be determined by measuring the length, l, and the width, b, after deformation. The spreading in the tangential direction is determined by the distance, x_o, from the axis of the body to the center line of the initial square, and the distance, x, to the corresponding section of the hollow cylinder after deformation, and is

$$\phi_t = \log_e \gamma = \log_e \frac{x^*}{x_o}$$

*For numerical determination of this quantity, see Part II, section 7.



Figs. 131, 132 *and* 133—*Extrusion tests with lead billets*

In Table XVII, the change of length (4), the alteration of thickness in the radial direction (6), and the change of width in the tangential direction (8), were determined from the distances of the center line from the axis of the body (2), and from the distances between successive lines in the longitudinal and transverse directions (3) and (5), in relation to the initial magnitudes of these distances. As should be expected, the elongation ($\log_e \lambda$) is the same throughout the entire cross section. It depends only upon the cross-sectional areas of die and mandrel. The spreading ($\log_e \gamma$) is equal to infinity at the edge of the hole, because an element of the body lying at the central axis must be expanded into a ring of finite diameter. The spreading decreases with increasing distance from the central axis up to

Table XVI

Deformation Relations after Extrusion*

1	2	3	4	5	6	7	8
		Displacement angle		Inclination angle			
Reduction of area per cent	Distance from center line inches	δ degrees	tan δ	α degrees	tan α	Stretching $\log_e \lambda$ per cent	Total deformation Φ_1 per cent
50	0.415	73.8	3.45	10.0	0.177	69.3	118.4
	0.359	68.2	2.50	10.8	0.192	69.3	99.4
	0.304	54.0	1.38	8.9	0.157	69.3	80.9
	0.249	44.0	0.97	7.3	0.126		75.7
	0.193	40.0	0.84	6.3	0.110		73.5
	0.138	38.0	0.53	4.2	0.072		71.3
	0.083	18.0	0.33	2.6	0.045		70.3
	0.028	5.0	0.09	1.0	0.018		69.3
66.7	0.340	82.6	7.77	5.4	0.095	109.9	164.9
	0.294	78.8	5.07	5.8	0.100		145.6
	0.249	75.5	3.87	5.6	0.098		134.6
	0.204	71.0	2.90	5.0	0.088		125.0
	0.159	53.6	1.36	3.4	0.057		114.3
	0.113	35.5	0.71	2.0	0.034		112.2
	0.068	19.8	0.36	1.2	0.020		111.0
	0.023	8.5	0.15	0.7	0.012	109.9	110.5
75	0.295	85.0	11.43	3.6	0.062	138.6	195.7
	0.256	83.0	8.14	4.0	0.070		173.0
	0.216	80.0	5.67	3.5	0.061		161.5
	0.177	76.5	4.16	3.0	0.051		153.4
	0.138	73.0	3.27	2.6	0.046		148.6
	0.098	69.5	2.60	2.4	0.041		144.4
	0.059	48.5	1.13	1.2	0.021		140.7
	0.020	28.0	0.58	0.8	0.015	138.6	193.3

*Compare Figs. 131 to 133.

Another BANTAM development

THE COMBINATION THREE ROW BEARING

Which Combines Straight Rollers For Their Load Carrying Capacity and Compactness With Tapered Rollers to Carry Thrust Load

This Bantam Heavy Duty Bearing is 26" bore x 42" O. D. x 25½" long. Due to the use of tapered rollers at the ends and a long row of straight rollers in the center this bearing combines the load carrying capacity and compactness of the straight roller with the thrust load carrying qualities of the tapered roller.

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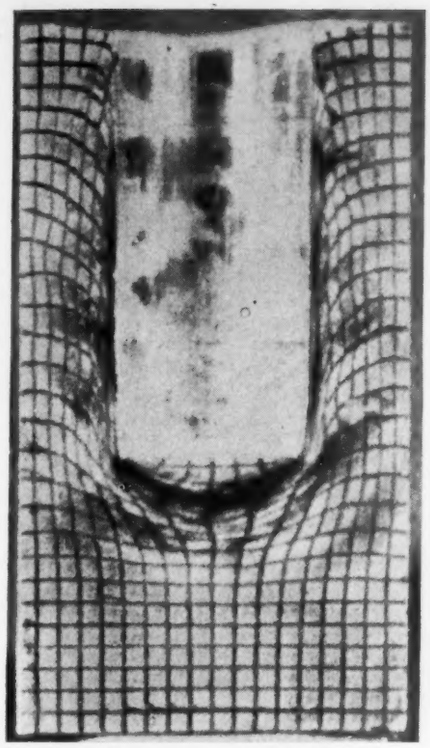


Fig. 135—Piercing test (chamber diameter = 1.405 inches, mandrel diameter = 0.704 inches

the wall of the die, where it has the value zero, because here no enlargement of diameter is possible.

The compression in the radial direction ($\log_e \beta$), as was stated previously, is equal to infinity at the edge of the hole, and at the wall of the die is equal to the elongation. In addition to these deformations in the tangential, radial and axial directions, shear displacements (9) and (10) occur, which reach high values along the inner side of the pierced body. If the shape (11) and position (12) of the ellipsoids of deformation are determined from these records, the total deformations of the individual parts of the cross section are obtained, as shown in column 13. These values, in the outer zones, differ only slightly from the values of radial change of thickness obtained without additional displacement. Precise test evaluation had to be foregone in the innermost strips, because the displacement here, as follows from Fig. 135, cannot be determined satisfactorily.

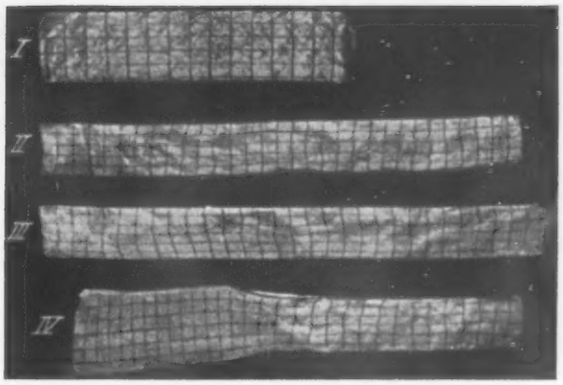


Fig. 136 — Cold-rolling tests

ROLLING TESTS. To obtain conclusions regarding the deformations occurring in rolling, tests were made on a cold mill having 7.09-inch diameter rolls, with aluminum and lead bars of 0.866-inch to 1.02 inches thickness and 1.18 inches total width which were split longitudinally. The bars were provided with co-ordinate lines 0.197-inch apart on the parting surfaces. The two halves of each bar were pressed together during rolling, by means of tightly adjusted guides. Fig. 136 indicates the condition of deformation in these bars after rolling. Bar I is of aluminum, and was reduced 21 per cent. Bars II and III, however, are lead bars, and were reduced 18.7 per cent and 26.7 per cent respectively. Bar IV is a cobble, which was obtained by stopping the rolling process during rolling with a 26.7 per cent reduction of thickness.

In contrast to the processes previously described, absolutely no appreciable uniformity in bending of the transvere lines, either forward or backward, can be established; which indicates a favorable forming process with regard to the internal losses, because the deformation of the rolled material proceeds almost as pure elongation and compression.

The almost parallelopipedal deformation in the cold rolling of metals is atributed to the small friction between the bar and the roll surface, as well as to the moderate reduction. In the rolling of materials in which the friction between material and rolls is great, such as kaolin, for instance, the originally plane cross sections of the rolled material, on the other hand, become bent backward severely, particularly if rolling is done with large reductions, as was pointed out by F. Kick and F. Polak[93]. The large additional shear displacements, which were observed by A. Hollenberg[94] in hot rolling tests, probably can be attributed principally to a nonuniform temperature distribution within the bar; as a result of which the colder edge zones of the bar accordingly are pressed out behind the central zone, which still retains the original furnace temperature, because the outer parts, being more rigid, are at first deformed less. N. Metz[95], also, was able to establish a slight bending of the originally plane cross sections after hot rolling.

(To be continued)

[93] F. Kick and F. Polak: Beitrage zur Kenntnis der Mechanik weicher Korper; Dinglers polytechn. Jour. (1877)p.465, (1879)p.257.

[94] A. Hollenberg: Bemerkungen zu den Vorgangen beim Walzen von Eisen; St. u. E. 3(1883)p.121.

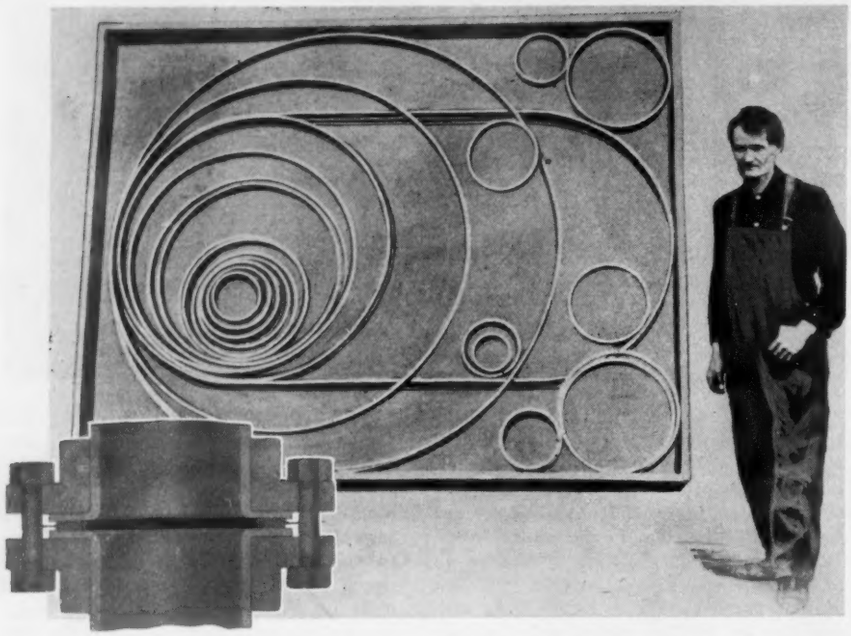
[95] N. Metz: Experimentelle Untersuchungen uber den Materialfluss beim Walzen; St. u. E. 46(1926)p.476; Arch. Eisenhuttenweis. 1(1927/28) p.193.

Table XVII

Deformation Relations after Piercing*

1	2	3	4	5	6	7	8	9	10	11	12	13
		Stretching		Radial Change of Thickness		Tangential Expansion		Displacement Angle		Inclination Angle		
Cross sectional strip	Distance from center line inches	λ	$\log_e \lambda$ per cent	β	$\log_e \beta$ per cent	γ	$\log_e \gamma$	δ Deg.	$\tan \delta$	φ Deg.	$\tan \varphi$	Total Deformation φ_2 per cent
I	0.673	1.29	25.4	0.768	— 26.6	1.012	1.2	0	0	0	0	— 26.6
II	0.618	"	"	0.740	— 30.0	1.048	4.6	3.8	0.067	2.0	0.035	— 30.6
III	0.561	"	"	0.708	— 34.4	1.096	9.2	11.0	0.194	4.8	0.085	— 35.5
IV	0.506	"	"	0.663	— 41.2	1.171	15.8	25.0	0.466	8.5	0.150	— 45.4
V	0.457	"	"	0.600	— 50.8	1.290	25.4	34.0	0.675	9.0	0.160	— 57.4
VI	0.414	"	"	0.514	— 66.4	1.508	41.0	61.5	1.842	11.3	0.201	— 89.4
VII	0.377	"	"	0.404	— 90.6	1.920	65.2	79.0	5.400	8.0	0.140	—159.5
VIII	0.350	"	"	2.660	—133.7	2.960	108.3	....	.....	....	.....	.....
IX	0.336	"	"	0.885	—239.7	8.530	214.0	....	.....	....	.....	.....

*Compare Fig. 135.



—Courtesy Chicago-Wilcox Mfg. Co., Chicago

Group of gaskets, ranging in diameter up to 67 inches, used on large turboblower installation at a steel plant. Inset shows another type of gasket, for sealing a pipe joint

LARGE USES OF STEEL IN SMALL WAYS

257th Article ◆ Gaskets

IN MAKING containers impervious to the escape of enclosed fluids, gaskets play an important part in the operation of various types of equipment and machinery. Gaskets have been used by industry for many years to seal pipe joints, automobile engine heads and manifolds, boiler manholes and handholes, steam chests, traps and in numerous other instances where a close fit between adjacent parts is necessary.

Size and shape vary widely, from the simple circular unit required for a pipe valve or fitting to irregular sections such as are inserted between the head and cylinder block of an internal combustion engine. Materials from which gaskets are made also are numerous, choice depending on the particular application. Some manufacturers carry as many as 20 different materials in stock, ranging from paper to nickel silver and including copper, brass, lead, steel, aluminum, cork, leather, canvas and rubber. The class of service, temperature, pressure and nature of enclosed fluid determine the selection of the material best suited.

Copper formerly was employed in the manufacture of a large majority of gaskets adapted to installations of most severe service, and while it still is used extensively, steel has made inroads in this market during recent years. This trend has developed through the necessity for greater strength and heat resistance to accommodate higher temperatures and pressures employed in the power, petroleum and other industries and in part because of economical reasons.

More Steel Being Used

It is estimated that several hundred tons of flat-rolled steel are consumed annually in the manufacture of gaskets. Use of steel gaskets in automobile engines recently has helped to swell the use of this material. Motor gaskets generally are made wholly of steel or copper or a combination of these two metals.

Ring gaskets are used extensively in piping installations. These may be U-shaped in cross-section so that pressure of the steam or water acts upon the elastic filling and tends to force the metal section of the gasket outward against the adjacent flange faces which are to be sealed. Corrugated gaskets, a popular design, give additional resiliency when the flanges are brought together. Both types are made to standard dimensions and usually have a filling of asbestos, this material being particularly adapted to installations where high pressures and temperatures must be resisted. For less severe service rubber, cork or leather filling may be used.

Most ring gaskets for standard fittings range between 2 and 56½ inches in outside diameter, although there is no limit on special sizes. When made of steel, 26-gage cold-rolled material commonly is employed. Smaller gaskets are stamped from sheets and formed without joints, but for diameters over about 48 inches brazing is done when a continuous piece is required.

Plating to Avoid Rust

Rusting, an objectionable feature to the use of steel gaskets, has been overcome by one manufacture by cadmium plating, and this type of gasket has been adopted by a number of automobile builders. The asbestos filling is treated to make it water, gasoline and oil proof and is then given a special graphite coating. Stamped from steel sheets, the base blank is overlapped around the cylinder openings and port holes after insertion of the asbestos filling. Bolt holes are protected by a metal flange formed from the layer.

To prevent projections or ears of the gaskets from breaking, a bead is formed around such sections, while steel shims give added strength at the narrow points between adjacent cylinder openings. The bead around the edge of the gasket holds the asbestos in place, further anchoring sometimes being provided by small prongs formed from the steel base which pierce and clinch the filling. A steel flange is inserted around the combustion openings in some copper-asbestos head gaskets to provide additional reinforcement and heat resistance.

Zinc Consumption for Die Castings High in 1933

In an article, "Recent Die Casting Developments Open New Fields for Product," published on Page 25 of the Feb. 5 issue of STEEL, the authors, Sam Tour and F. J. Tobias, Lucius Pitkin Inc., New York, presented figures on the use of zinc for zinc-base alloys in recent years. These figures since have been found to be in error. The correct statement is as follows:

"The use of zinc for zinc-base alloys increased from approximately 30 million pounds in 1932 to 50 million pounds in 1933. The consumption of zinc for this purpose in 1928 was 28 million pounds and in 1929 was 36 million pounds."

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PROGRESS IN STEELMAKING

TWO compartments are incorporated in a new flag switch designed specially for sheet mill catcher tables. Contact mechanism is housed in one compartment and the centering spring mechanism in the other. The flag lever is high-carbon tool steel and its roller, hardened steel. Two sets of silver contacts are provided, one being normally open and the other normally closed. Use of friction bearings eliminates overtravel.

♦ ♦ ♦

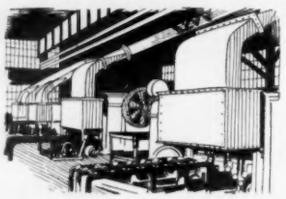
Transmitting the setting of the top roll of blooming mills to the operator's pulpit now is possible with a transmitting and receiving unit used in combination.

♦ ♦ ♦

Abrasive and wear-resistant qualities are claimed for a recently developed chrome-molybdenum steel. Resistance to abrasion is provided by two kinds of hardness, one of which is inherent due to the composition of the steel, and the other conferred by the heat treatment.

♦ ♦ ♦

Water and oil-proofing concrete storage tanks was accomplished in a simple manner at an Ohio plant recently. All crevices in the concrete surface were filled with a fairly wet packing mixture consisting of one part portland cement and three parts clean sharp sand. The patches were allowed to set for two weeks and then the surface of the tank was given a coat of plaster ⅜ to ½-inch thick. The plaster was made of two parts clean sharp sand and one part portland cement. Following its application the walls were wet down each day for a week and then dried. Excessive coatings of a soap solution and an alum solution were then applied to effect waterproofing. The soap solution is made by dissolving 1½ pounds of pure castile soap shavings in one gallon of boiling water. The hot solution is applied with a brush and is allowed to dry before the next coat is applied. The alum solution is made by dissolving ¾-pound of powdered alum to a gallon of cold water. The dry soaped surfaces are covered with the alum solution and after a few days of drying a hardened insoluble compound will have formed. After three coats of soap and alum has been applied, the tank will have been made leak-proof.



AN OHIO sheet maker frequently employs a continuous pair furnace for normalizing purposes merely by installing a hood over the end of the furnace following the week's rolling schedule.

♦ ♦ ♦

Preventing the infiltration of hot gases is the purpose of a recently marketed cement which is applied to the interior face of any of the various types of refractory insulating brick. Tests disclose the cement is so free from shrinkage that it retards the shrinkage of the insulating brick themselves.

♦ ♦ ♦

Increasing the life of carbon scrapers for by-product coke ovens from three to 75 days has been accomplished by the application of a hard-facing material. The total cost of treating the scrapers is less than $4.

♦ ♦ ♦

Aluminum for deoxidizing open-hearth heats in the furnace now is available in the form of castings. In plan view the castings are star-shaped and are similar in appearance to large-toothed pinions. The individual teeth are equivalent in size and exposed area to the blocks of the conventional type of straight notched aluminum bars and afford the same ease of contact with and quick solution in the bath of steel. The stirring rod fits snuggly in the hole at the center of the casting. The radial thickness of the hub is so proportioned to the bulk of the teeth that the latter cannot become detached from the assembly except by melting away progressively from the periphery toward the center. Operating data disclose that uniform deoxidation of the bath is obtained with this new form of casting.

♦ ♦ ♦

Some coke oven operators have found a preference for waterproof material as an oven roof covering when the ovens are cooled down over a wet or winter season in preference to a pitch covering. It has been found in some cases that a waterproof covering absorbs a desired certain degree of moisture to the exclusion of air.

OLD AND NEW METHODS OF STRIPPING WIRE FROM BLOCKS
At the left, a husky wire drawer is stripping a 300-pound bundle—a man-killing job under the old conditions. At the right, a hoist permits the workman to strip a 450-pound bundle by a simple twist of the wrist

PROGRESS IN MANUFACTURE AND USE OF WIRE AND WIRE PRODUCTS

BY F. H. NULLMEYER
Youngstown Sheet & Tube Co.

DRAWING of wire is the art of reducing the diameter of a metallic rod and increasing its length by drawing it through a die. The operation is performed by the simple application of power, which revolves the drawing block—a cylindrical block on which the wire is wound, thereby pulling the metal through the die and winding the resulting wire upon the block. This simple process produces wire of accuracy of size impossible to obtain by any other method.

As far back as 1925, according to a census report of the department of commerce, there were over 57,000 wire drawing blocks in use in the United States, with an annual capacity of 5,087,307 tons of wire. Sizes ranged from the coarsest to the finest gages, and diameters of drawing blocks varied accordingly, from about 3 feet to as small as 4 inches.

Up until 1925, and in some plants after that time, wire drawing was usually done in the following manner: Drawing blocks were grouped in what were known as wire drawing benches. For finer sizes there were sometimes as many as 50 blocks to a bench. The number was fewer, of course, for coarser sizes. In either case, the usual method of driving the blocks was by a shaft running the full length of the bench below the floor line. Mounted on suitable bearings upon this shaft were bevel pinions which, in turn, meshed with bevel gears in which a spindle was secured.

Geared to One Shaft

The spindle extended upward to the top of the bench on which the wire drawing block was mounted. Some suitable device—such as jaw clutch, friction clutch, or driving pins—was provided for engaging the block and rotating the block with the spindle. The speed at which the blocks revolved was fixed through the gear combination between the shaft and the spindle.

It followed, therefore, that the speed of the blocks could not be changed except by changing the speed of the shaft or altering the gear combination. The result was that, once installed, the blocks usually continued to operate at original speed.

But speed of rotation alone does not determine drawing speed. Drawing speed in feet per minute is equal to the circumference of the block multiplied by its revolutions per minute. Small blocks of minimum diameter, drawing the finest gage of wire, should rotate at about 80 revolutions per minute. As wire sizes and block diameters increase, revolutions per minute naturally decrease.

Under the shaft-drawn type of installation, all blocks on a bench were carried at a fixed speed with respect to the shaft, and therefore there was no flexibility with respect to the speed of rotation of blocks within one bench. This meant that a mill equipped to draw large wire as well as fine wire had to have certain benches for large wire, certain

Mr. Proctor Patterson, President of the W. S. Tyler Co., who says a few words on the subject of paper... also oil, foods, drugs and buildings

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"The reliance that paper makers place on Monel wire cloth is paralleled in many other fields. By makers of foods, producers of drugs and chemicals, and refiners of oil.

"They employ Tyler Monel Metal sieves and filters both to assure the mechanical fineness of their products and to protect against any possibility of contamination.

"In addition to its wide use in industrial processes, Tyler Monel Metal wire fabric of coarser weave is employed to ornament elevator cars, guard tellers' cages and do duty in countless similar architectural applications."

★ ★ ★

Wherever corrosion, wear or rust must be guarded against, you find Monel Metal the standard material employed at every point subject to their attack.

It is widely used in the equipment of laundries, dyehouses and chemical plants; in the pickling departments of steel mills, and in power plants; in hotels, restaurants and hospitals; in canning, packing and preserving plants; and in the manufacture of many different kinds of merchandise.

Because Monel Metal is strong, resistant to corrosion and strikingly beautiful, it is widely used in kitchens; for sinks, cabinet tops, range tops, hot water tanks and tables.

In *your* business, is there a place where Monel Metal could be employed to advantage? Are others in your industry using Monel to speed production, cut costs, or increase the attractiveness and salability of their goods? A line to us will bring you complete information. Write today.

THE INTERNATIONAL NICKEL CO., INC., 67 Wall Street, New York, N. Y.

MONEL METAL

Monel Metal is a registered trade-mark applied to an alloy containing approximately two-thirds Nickel and one-third copper. Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.

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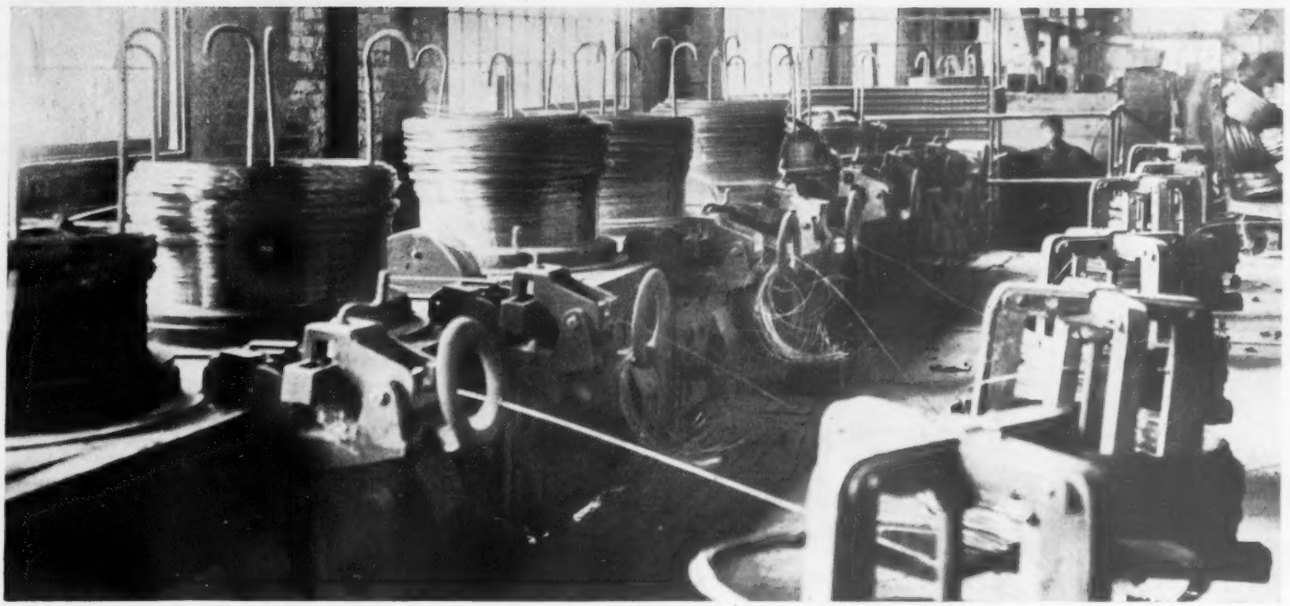


Old style wire drawing blocks. All blocks are on one bench and are driven at the same speed from the same shaft

benches for small wire, and inevitably some benches that could only be used for one, or at most, a very few ranges of wire sizes. Character of steel, as well as sizes, called for change in speed, as higher carbon or hard steels must be drawn slower than soft steels.

Thus a mill equipped with benches where all blocks were geared to a single shaft was extremely inelastic inasmuch as the equipment could not be regulated to meet demand in such a way that all machines could be operated together. The result was that most of the time a few blocks were standing idle, bringing in no return on investment, yet consuming power, requiring lubricants and necessitating repair expense.

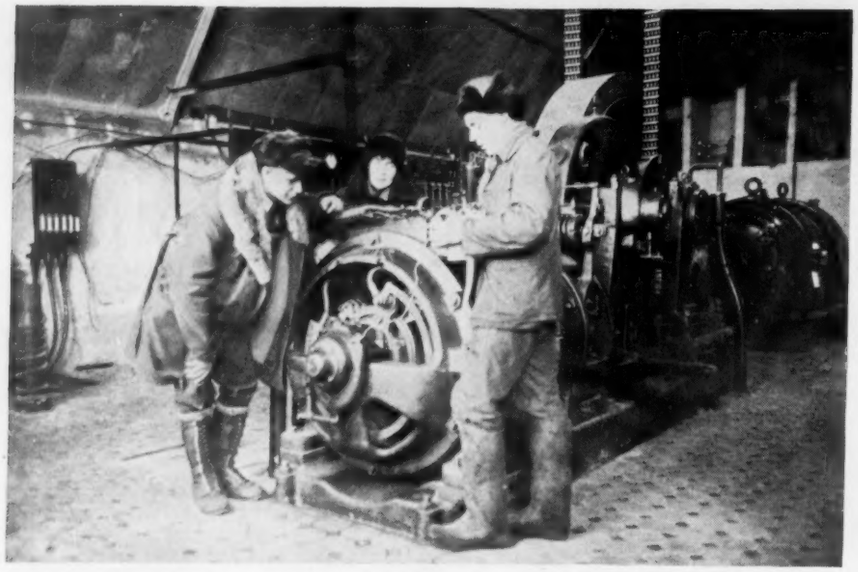
Lacked Labor-Saving Devices

Proper labor saving equipment likewise was lacking in this type of mill. The number of blocks assigned to a wire drawer was dependent upon the size of wire to be drawn. One wire drawer usually handled one block with wire from ¾-inch down to ½-inch and, as sizes decreased, more blocks were handled per man. With the finer gages, such as No. 36 or No. 38 (0.009 to 0.008-inch respectively), one man could handle as many as 40 or 50 blocks. At this point, however, length of wire as well as weight became a factor, and a 10 to 15-pound bundle of this size of wire was sufficient for a man to handle, considering that it averages about a mile to the pound.

It was in the drawing of larger sizes of wire that husky wire drawers were needed for, after drawing, the block had to be stripped—that is, the wire had to be removed from the block. To do this, the wire draw-

(*Please turn to Page 50*)

A battery of Nullmeyer machines in a wire mill of Youngstown Sheet & Tube Co. The blocks are driven by individual motors



TUNING UP: Bell hoist and motor-generator set installed in blast furnace plant, Magnitostroy district, USSR

Filling Equipment for Blast Furnace Steps Up Output

BY E. C. KREUTZBERG
Eastern Manager, STEEL

INSTALLATION of improved blast furnace filling equipment recently was completed by the Otis Elevator Co. at a number of stacks in the Magnitostroy district in Russia. This equipment is believed by the company to incorporate the latest ideas in design based on a wide and extensive study of modern needs and to be ideal for use with American blast furnaces.

Equipment has been developed in line with the conception that the continued demand for greater tonnage from a single furnace has increased the importance of technical problems that formerly were given slight consideration. The improved filling equipment is intended for use where the capacity of a furnace is to be increased from between 600 and 800 tons per day to between 1200 and 1500 tons.

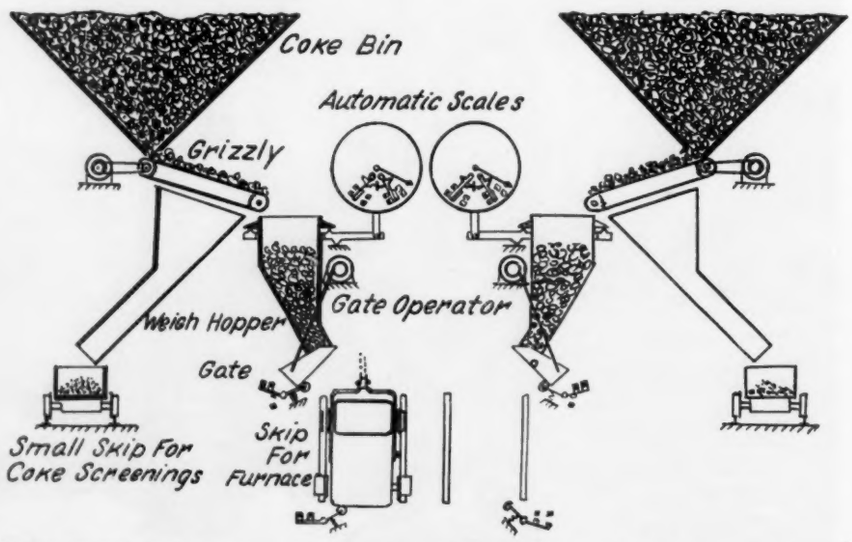
In brief, the system comprises a hoisting mechanism and motor, together with controls for interlocking this with other equipment in the blast furnace unit, all built by the Otis company. For loading coke into the skip and starting the skip when loaded, a control device is provided which, when interlocked with the skip hoist and bell hoist controllers, relieves the scale car and its operator from handling the coke. However, provision is made so that, as needed, the operator can supply extra loads of coke to the furnace by the same loading method but without interfering with the normal sequence of the filling operations after the extra coke has been supplied.

This controlling device has among its many new features two that are of particular importance; both are fully automatic. The first involves dumping a load of coke in the furnace skip when this load is needed in the filling cycle. The second is a means to insure the opening of the gate of the hopper corresponding to the skip in the loading position.

Coke is supplied to bins over each side of the loading point of the furnace skip. There is a bin, a grizzly, a weigh-hopper and a small skip for each furnace skip. The outlet from each bin leads to a grizzly and each grizzly is built at such an angle to the outlet of its bin that the coke is "in repose" except when the grizzly is in motion. When either coke weigh-hopper is empty and the gate is closed the grizzly is set in motion. The coke at the outlet of the bin is no longer in repose but passes over the grizzly, is screened, and the larger pieces are carried to the weigh-hopper until the hopper is filled with a predetermined amount of coke. The hopper then tilts automatically and a contact is broken, shutting down the grizzly.

At the completion of the screening by the grizzly, a small skip, into which the screenings have gone, is started and the coke screenings are carried up and dumped into a bin, to be withdrawn and used where smaller coke is suitable. This skip automatically returns to its position under the grizzly to receive the screenings from the next operation. The gate for the weigh-hopper, when opened, dumps the load of coke into the furnace skip.

Necessity for correct distribution of materials in the blast furnace has not permitted a great increase in the capacity of the furnace skip. Therefore, the amount of the material to be carried to the top and dumped has been increased largely by speeding up the skip. The generally accepted, standard, single motor, double-



HOW IT WORKS: Diagram showing electrical arrangement for automatic charging of blast furnace skip

5 GOOD REASONS *for Using Norton Abrasives*

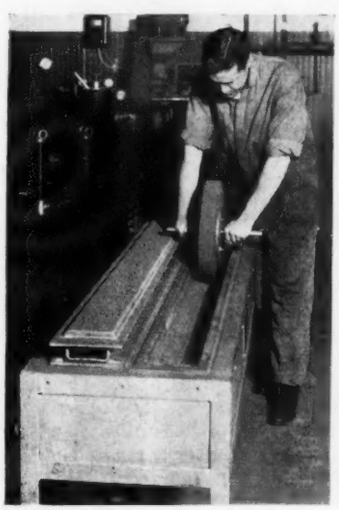
1 **A wide range of products**—two abrasives (Alundum and Crystolon), each available in a variety of grain shapes and treatments to meet the technical requirements of all polishing jobs.

2 **An unusually high standard of quality**—constantly and vigorously maintained by an elaborate inspection system that guards the product at every step from mine to shipping room.

3 **The service of large-scale manufacture**—a large and modern electric furnace plant coupled with efficient manufacturing equipment assures production capacity to meet any demand.

4 **An efficient distribution system**—ample stocks at Worcester supplemented by stocks at the five Norton branch warehouses and with distributors in all large cities. Orders from a pound to a carload can be efficiently handled.

5 **A high-class technical service**—highly trained men at Worcester and in the field to give you real help on your polishing problems, men who combine a thorough knowledge of abrasives with practical polishing experience.



NORTON COMPANY, WORCESTER, MASS.

New York Chicago Detroit Philadelphia Pittsburgh Hartford Cleveland
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NORTON
POLISHING ABRASIVES

G-13

reduction, herringbone-geared hoist still proves itself the most desirable type of machine. Though for these larger furnaces the hoist is larger, there has been little change mechanically from the accepted design of the past.

Electrically, however, important modifications have been found desirable. The problem of a controller to handle the high currents is solved easily by the use of multi-voltage control. While during the running period the skips are in balance, during starting period the skip at the top is in the dumping position and its effective value as a counterweight for the loaded skip is reduced about 60 per cent. These conditions were borne in mind in determining the commutation and the starting torque of the motor.

When the skip is speeded up, more materials are brought to the top of the furnace. To meet this condition, it was necessary to develop a larger bell hoist and one of a different type, as the loads on the bells and their speed of operation are beyond the range of the well-known crank-type bell hoist. The Otis Elevator Co., therefore, developed a single machine which will open either large or small bells, and which retains the advantage of the crank-type bell hoist in seating the bell.

The control of this bell hoist is interlocked with the controls of the skip hoist, stock line recorder, distributor and automatic coke-loading device, so that each operation of these various units takes place in its proper sequence and without any attention from the operator in the stockhouse other than starting up the hoist for the ore and stone loads. As noted above, the entire filling operation for the coke is fully automatic.

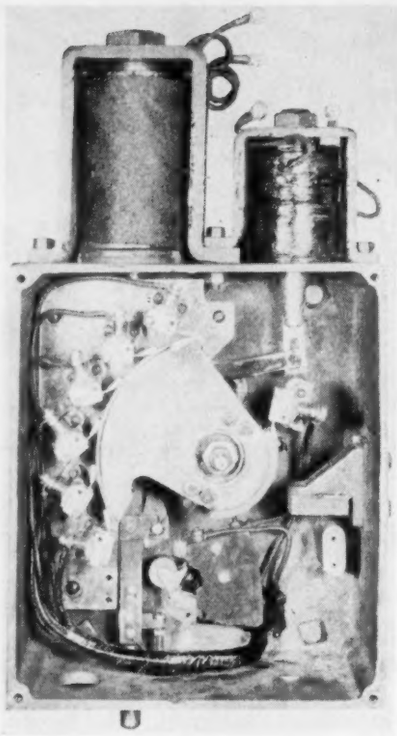
Progress in Manufacture And Use of Wire

(*Concluded from Page 47*)

er lifted the wire from the block, grasping the bundle with his hands and arms at two places farthest from his body, and supporting the portion nearest his body against his stomach. In this manner he had to carry the wire to a truck or reel, the bundles often weighing 150 pounds. In the summer, efficiency was much reduced because of the heat.

Since 1925, with improved processes, bundles have increased in weight until in one plant at the present time they weigh as high as 900 pounds. Of course, under these circumstances, it is out of the question for men to strip blocks without mechanical assistance.

Many improvements in this direction have been recorded in recent years. Stripping equipment has been developed which consists of a light overhead electric hoist which can



SEQUENCE SWITCH: Otherwise known as a ratchet selector switch, this device synchronizes operation of the coke bin gate

be pushed to any position from above the center of the drawing block to several feet on any side of the block to carry the wire to floor reels or trucks as desired. This modern method of stripping the wire is shown in the illustration on page 45.

However, the greatest improvement since 1925 has been the replacement of blocks geared to a common bench shaft by blocks driven by individual motors which permit variations of speed per individual block. This has resulted in much greater production per man per block, because of increased flexibility. It has cut down capital expenditure and plant space, and reduced amount of idle equipment.

During 1926, 1927 and 1928, patents were granted me covering individually motor driven wire drawing machines and attachments, on which all sizes of wire, from ¾-inch down to No. 20-gage, or 0.0348-inch, may be drawn on one machine.

Equipment Has Wide Range

In the case of the smaller wires, several drafts may be required to obtain final finished size. The number of drafts also varies with the hardness of the steel, hard stock possibly requiring more drawings. Size of rod also is a factor which determines the number of drafts required. In the mill of the Youngstown Sheet & Tube Co., where machines of this type are installed, No. 5-gage or 0.207-inch rods, are the smallest used. Time required for a number of drafts, however, is more than offset by the advantages of adjustability.

These machines, known as Nullmeyer machines, have interchangeable shells or blocks, so that fine wire may be drawn on smaller ones, or heavy wire on larger ones, with variable motor speeds of a range from four to one. Proper speed to fit required sizes is therefore easy to obtain. The machine has a further advantage in that it is built with a turntable upon which two wire drawing blocks are mounted. The table turns on a pivot between the two blocks, at which point the die molder and the lubricant box are also attached. When the turntable is locked (which is done automatically) only one of the two blocks can be driven by the motor. The other block, meanwhile, extends toward the passageway, where stripping cranes are ready to unload the wire from the block onto a truck, or carry it up or down the mill to other machines, for further processing. Thus, while one bundle of wire is being removed, a new drawing is taking place.

Saves Stripping Time

The turntable has further advantages when several drafts are required. When the first draft is completed, the table is turned half a revolution. The block full of this partially drawn wire now acts as a reel to pay off the wire to the drawing block, thus saving the time of stripping the block and loading the wire on a floor reel. This is a distinct improvement over the old bench type of blocks, and also over the motor driven single block machines, which required considerable floor space in which to store partially completed wire for further drafting.

The machines are equipped with roller and ball bearings, and with the latest electrical equipment, such as slow speed starting and accelerating controls. When the draft is completed, the motor is automatically stopped. Safety devices are provided to stop the machine instantly when necessary to prevent injury to a worker or damage to equipment.

Production per man obtained with these machines has more than doubled that of the old style draw benches. Fewer men have been required for operation, and the number of accidents has been reduced. Overhead has been cut down because of reduction in building maintenance expense, light, heat, space, repairs and power cost. Under the old system a great share of the equipment was in operation regardless of whether wire was being drawn or not. With the new machines, this loss is prevented, as no machine need be operated unless wire is actually being drawn.

In next week's issue, Mr. Nullmeyer, who is superintendent of the rod wire and conduit department, Youngstown Sheet & Tube Co., Youngstown, O., will discuss recent trends in wire drawing dies and lubricants.

THE EDITORS

NEW EQUIPMENT

PRODUCTION FABRICATION
TREATMENT FINISHING

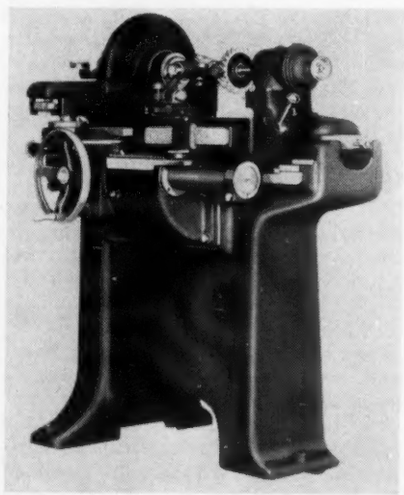
Weatherproof Outlet — General Electric Co., Bridgeport, Conn., is introducing a weatherproof outlet which will facilitate the use of outdoor lighting fixtures and appliances. The unit is made of cadmium plated brass. Flush plate has a solid rubber pad mounted on the back with a good fit when the device is screwed in place. A cap slips over the plug and screws onto the device to provide a weatherproof connection.

♦ ♦ ♦

Helical Gear Lead Testing Unit.—Lees-Bradner Co., 6210 Carnegie avenue, Cleveland, has brought out a machine which not only measures accurately the helix angles or the lead of helical gears but in addition calibrates the machine settings. The gear being tested is mounted between centers in the machine, shown herewith. A tooth contactor is adjusted into position with one of the gear teeth.

Indicator carriage is traversed parallel to the gear axis by means of a handwheel at the front of the machine. Any deviation from true lead of gear is registered on the direct reading indicator in ten thousandths of an inch. To insure that the indicator reading of the gear tooth is a true representation of the deviation from theoretical, provision has been made in the machine for an accurate calibration of the rotary motion of the work spindle relative to a known distance traversed by the contactor in engagement with the gear tooth.

It is not considered sufficient with the delicate measurements being made to assume that the angular adjustment of straight-edge, accurately as it may be set, will insure correct and accurate readings. To overcome any possibility of error in machine settings, a method has been provided for checking the angular rotation of work spindle and linear distance traversed by the tooth contactor. The rear of work spindle has been provided with an index plate engaged by a direct reading ten thousandths inch indicator. The front indicator carriage is equipped with an adjustable holder on which is mounted another direct ten thousandths inch indicator.



New Lees-Bradner helical gear lead testing machine

♦ ♦ ♦

Tapping Machine—Langelier Mfg. Co., Providence, R. I., recently placed on the market a horizontal bench-type tapping machine. The unit is applicable to light tapping operations in optical, radio, electric, and jewelry parts. Capacity is 3/16-inch in sheet metals. A tailstock is provided with a shaft having a tapered socket so that fixtures can be used if necessary to align the work on the tap. Distance from bed to center of spindle is 3¼ inches.

♦ ♦ ♦

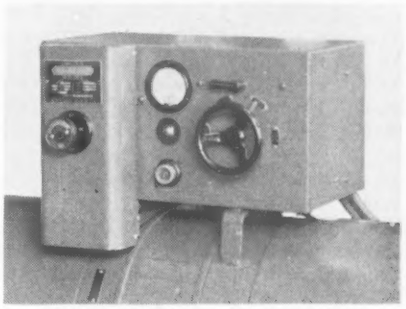
Jig Borer—R. Y. Ferner Co., Investment building, Washington, is marketing in this country a new large jig borer developed by Societe Genevoise d'Instruments de Physique, Geneva, Switzerland. The unit has two vertical and one horizontal boring heads. A 59 x 40½-inch work table is moved by a motor or by hand through 52 inches by a micrometer lead screw.

The two vertical boring heads are mounted on a slide on the cross rail and have 40 inches motion across the table. The horizontal boring head has 20½ inches vertical movement, from 8 to 28½ inches above the table. Horizontal spindle can be employed most effectively for boring holes in all sides of a job by mounting the work on the large circular table. This unit will handle jobs as large as 60 x 55 x 32 or 33 inches high, and even longer jobs can be carried out by doing the work in two sections.

♦ ♦ ♦

Remote Control for Arc Welders—Lincoln Electric Co., 12818 Coit road, Cleveland, is introducing a new remote control device for arc welding machines. No additional cables or other apparatus need be carried by the operator. By tapping the electrode on the work several times, the voltage is raised automatically; a larger number of taps and the voltage is lowered. Thus, by merely making and breaking the electrical circuit, the current output is controlled.

With this new control device, shown herewith, the operator can work at any distance from the machine and regulate the current accurately without making trips back and forth to adjust the controls. This feature is particularly advantageous on structural work, in boiler and tank shops, on pipe lines, in steel mills, ship yards, etc. Mechanism is encased in a small box which may be attached quickly to the welder voltage control. The company is offering the control as optional equipment on its shielded arc welders, or it may be purchased separately for motor-driven, belt-driven or gasoline engine welders now in use.



Remote control for arc welders developed by Lincoln Electric Co.

♦ ♦ ♦

Lighting Panelboard—Square D Co., Switch & Panel div., Detroit, is marketing a new no fuse circuit breaker lighting panelboard. While standard in all operating features, dimensions and capacities, the unit is outstanding in external appearance. Front of the trim is finished in academy brown, while the inside of the door and barriers are golden wheat tan. Interior is walnut bakelite and operating handles are orange plaskon.

♦ ♦ ♦

Tractor—Caterpillar Tractor Co., Peoria, Ill., recently introduced a new model tractor powered with a 4-cylinder, 4-cycle, valve-in-head engine developed especially for converting a wide range of low volatility fuels into efficient tractor performance. The engine has a 4-inch bore and 5-inch stroke and develops a maximum horsepower of 23.69 at the drawbar

and 28.39 on the belt at governed speed of 1250 revolutions per minute. Lubrication is force feed to all main, connecting rod and rocker arm bearings. A twin fuel tank holds 20 gallons of tractor fuel and 2 gallons of gasoline, which is used in starting, and a 3-way fuel control valve is located on the dash in easy reach of the operator. The new model is available in either standard or wide gage models.

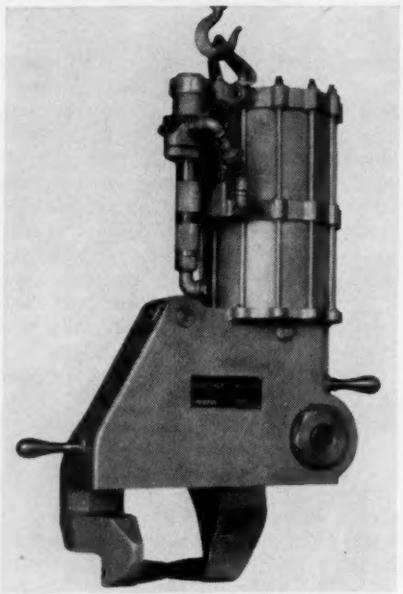
♦ ♦ ♦

Truck-Mounted Welder—Universal Power Corp., 1719 Clarkstone road, Cleveland, now is mounting its welders in gasoline trucks. The truck engine drives the shunt indicator type welding unit. This new portable unit for the welding industry was developed through the co-operation of the Universal company with the Ditwiler Mfg. Co., Galion, O., builder of the truck. By interlocking the power takeoff with the engine governor the welder operates at controlled engine speed. The truck can not be driven until the power takeoff is disengaged.

♦ ♦ ♦

Squeeze Riveter—Hanna Engineering Works, 1765 Elston avenue, Wicker Park station, Chicago, recently developed a light, compact squeeze riveter of the "alligator" or "nut cracker" type. As shown herewith, the mechanism is entirely closed and consists of a roller and toggle that transmit the power movement of the cylinder piston unit to the moving die. This is accomplished in such a manner that the latter is closed upon the rivet with a minimum power consumption and yet exerts a known and predetermined tonnage on the dies regardless of considerable variation in length and thickness of rivet.

The riveter shown develops 20 tons between the dies, sufficient for heading ⅝-inch diameter cold and ⅝-inch diameter hot rivets. Die stroke is 2 inches. Both jaws of the alligator type riveter can be entered into a pocket to head a rivet which could not be reached by another type. Considerable variation in the reach and shape of these jaws is possible.



Compact squeeze riveter introduced by Hanna Engineering Works

♦ ♦ ♦

High-Speed Grinder — Hammond Machinery Builders Inc., 1618 Douglas avenue, Kalamazoo, Mich., recently added to its line a 10 WWH high-speed grinder. This unit, shown herewith, was designed especially for high-speed wheels and can be furnished for a single motor drive for use with motors up to 15 horsepower.

Two independent spindles are embodied in the design and when used for single motor drive, the two inner ends of the spindles are coupled together with a combination coupling and V-belt pulley, making it possible to remove the belts by disconnecting the coupling without removing spindle from bearing housings. The grinder also is furnished as a two-spindle grinder, each spindle being entirely independent from the other and arranged for two motors, one for each spindle. Where each spindle can be used motors up to 7½ horsepower are suitable. With this arrangement, either spindle may be operated at different speeds from the other.

Sight feed indicators show oil level in the sump and oil from the filter being delivered to each bearing. Work rests are equipped with removable plates. Boiler plate steel wheel guards are provided. Standard types of motors are mounted on the rear of the base with V-belt drive to spindle. Spindle locks prevent spindles from turning when changing wheels.

♦ ♦ ♦

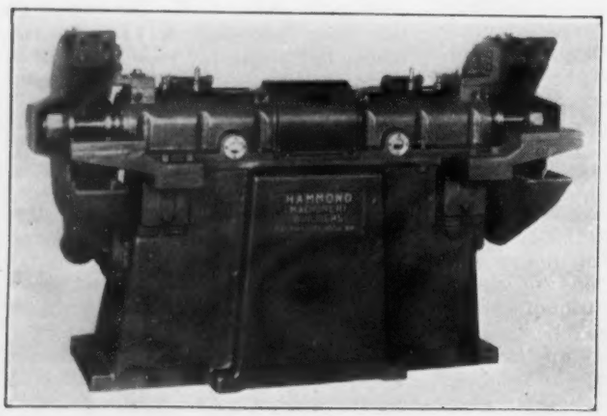
Blow Guns—Cleveland Pneumatic Tool Co., 3734 East Seventy-eighth street, Cleveland, recently placed on the market blow guns of drop forged alloy steel. The units are designed to withstand hard usage. Two styles are available, SP with plain thumb button, and style SLP, the same gun with an added outside lever that contacts the thumb button. The air stream through both types is controlled easily by applying a varying pressure on the control button or lever. Because the thumb button is shrouded, possibility of breaking or bending the valve stem is eliminated.

♦ ♦ ♦

Industrial Switches — Wadsworth Electric Mfg. Co. Inc., Covington, Ky., is announcing a new line of cover control, quick make and quick break, fused and unfused industrial switches. Available in 2, 3, 4 and 5 poles, 230 and 575 volts, these units come equipped with switch mechanism having self-aligning rectangular formed blades. Each blade seats in an individual fiber carrier.

♦ ♦ ♦

Welding Timer — Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., recently placed on the market a new welding timer for spot welding. In welding dissimilar metals, metals of high termal conductivity, special alloys and all light materials, a short and accurately controlled timing is essential. To meet this need the company offers this improved electronic tube control. Through the application of the device heat is localized to the immediate weld vicinity and because of its precision timing, uniform welds are assured.



HAMMOND high-speed grinder embodies lubrication system in which oil must pass through filter, thereby preventing abrasive matter from entering the bearings

ADVERTISING PAGES REMOVED

Steel Rate Off Only 1 Point on Labor Unrest

Automotive Industry's Consumption Little Affected So Far, though Contracting Is Slow—Rail Tonnage Heavier—Four Month's Rise in Scrap Checked

UNSETTLED labor conditions still handicap the steel market, though considering all the uncertainties last week demand showed a surprising degree of strength and steelworks operations eased off only 1 point to 49 per cent.

The explanation for this is that while strikes have been threatened in many iron and steel consuming plants, so far comparatively few have actually developed to the point of interrupting the flow of material. Until the issue in the automobile and related industries has been definitely settled, however, steelmakers view it as a continuing menace to recovery.

In Detroit, the hot-bed of discord, steelworks operations actually rose 7 points to 100 per cent; New England advanced 8 points to 71 per cent; eastern Pennsylvania, ½ point to 33 per cent. In only two districts were there declines; Pittsburgh, off 2 points to 33 per cent; Wheeling, 4 to 66. Youngstown held at 56; Chicago 48½; Cleveland 82; Birmingham 52; and Buffalo 52.

Railroad orders are increasing, and structural steel requirements are gaining moderately under seasonal influences. No important cancellations have been issued by automobile manufacturers, and there has been practically no diminution of releases from them. Reduction in production of automobiles as a consequence of disturbed labor relations has been negligible.

Uncertainties Delay Contracting; Upward Trend in Scrap Prices Checked

In the iron and steel markets last week, the labor factor was felt chiefly as an influence retarding future commitments. Though the majority of consumers are chary in closing contracts for second quarter, some specific requirements have been covered by users under the impression the steel industry itself faces an hour-and-wages issue, which cannot fail to increase costs and prices.

Scrap, reflecting the general market uncertainties, fell off 25 to 50 cents a ton in leading centers, though there was little reduction in consumption. For the first time since STEEL's scrap composite began to rise early last November, this index turned down, 8 cents, to $12.33, though still $3 above the starting point.

Over the next few weeks, steelmakers are depending on railroad requirements to take up much of the slack that may develop in other lines. Rail tonnage is coming in more rapidly, sustaining mill operations at Pittsburgh, and insuring Chicago mills rolling schedules for several months.

Including rail and track fastening orders last week, and those that probably will be awarded this week, more than 150,000 tons additional is added to mill backlogs. Illinois Central purchased 20,000 tons of rails; Chicago, Milwaukee, St. Paul & Pacific, 20,000 tons of rails and 27,000 tons of fastenings. Erie railroad is ready to distribute 32,000 tons of rails and 12,000 tons of fastenings; and New York Central, 40,000 tons of rails and a tonnage of accessories. The time for delivery of rails on sales at $36.37½ per ton made prior to April 15 has been extended one month to Aug. 31.

Structural Awards Heavier; Pig Iron And Coke Shipments Continue to Mount

Structural shape awards for the week, 26,979 tons, were up substantially from the preceding week. Fabricators are bidding on 12,000 tons of shapes and reinforcing steel for a government dam at Fort Peck, Mont., and on 5000 tons for a Boulder dam power house. For a fabricated plate water pipe line at St. Louis 9300 tons have been awarded. PWA loans to a total of $202,189,000 are being sought for projects requiring cast pipe.

Pig iron shipments this month in the lake districts and Middle West are 35 per cent higher than in February, for the comparable number of days; coke shipments are up 50 per cent. Increased rail buying has led to heavier importations of low phosphorus ore, 25,000 tons having entered at Atlantic coast points this year.

Rail business also figures conspicuously in foreign trade, STEEL's London cablegram stating the European International Rail Manufacturers' association has booked a substantial tonnage for Argentina, while China has ordered 17,000 tons in England. From the latter country 3000 tons of miscellaneous steel products were shipped to Russia.

STEEL's iron and steel price composite holds at $32.40; and the finished steel index at $51.10.

COMPOSITE MARKET AVERAGES

	March 24	March 17	One Month Ago Feb., 1934	Three Months Ago Dec., 1933	One Year Ago March, 1933	Ten Years Ago March, 1924
Iron and Steel Composite	$32.40	$32.40	$32.42	$32.42	$28.35	$43.24
Finished Steel Composite	51.10	51.10	51.10	51.10	45.60	67.18
Steelworks Scrap Composite	12.33	12.41	11.72	10.12	6.47	16.98

Iron and Steel Composite:—Pig iron, billets, slabs, sheet bars, wire rods, tin plate, nails, sheets, plates, shapes, bars, and black pipe. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

	March 24, 1934	Feb. 1934	Dec. 1933	Mar. 1933
Finished Material				
Steel bars, Pittsburgh	1.75	1.75	1.75	1.60
Steel bars, Chicago	1.80	1.80	1.80	1.70
Steel bars, Philadelphia	2.04	2.04	2.04	1.91
Iron bars, Terre Haute, Ind.	1.60	1.60	1.60	1.65
Shapes, Pittsburgh	1.70	1.70	1.70	1.60
Shapes, Philadelphia	1.90	1.90½	1.90½	1.65
Shapes, Chicago	1.75	1.75	1.75	1.70
Tank plates, Pittsburgh	1.70	1.70	1.70	1.60
Tank plates, Philadelphia	1.88	1.88½	1.88½	1.59½
Tank plates, Chicago	1.75	1.75	1.75	1.70
Sheets, No. 10, hot rolled, Pitts.	1.75	1.75	1.75	1.55
Sheets, No. 24, hot ann., Pitts.	2.25	2.25	2.25	2.00
Sheets, No. 24, galvan., Pitts.	2.85	2.85	2.85	2.60
Sheets, No. 10, hot rolled, Gary	1.85	1.85	1.85	1.70
Sheets, No. 24, hot anneal., Gary	2.35	2.35	2.35	2.10
Sheets, No. 24, galvan., Gary	2.95	2.95	2.95	2.70
Plain wire, Pittsburgh	2.20	2.20	2.20	2.10
Tin plate, per base box, Pitts.	5.25	5.25	5.25	4.25
Wire nails, Pittsburgh	2.35	2.35	2.35	1.85
Semifinished Material				
Sheet bars, open-hearth, Youngs.	26.00	26.00	26.00	26.00
Sheet bars, open-hearth, Pitts.	26.00	26.00	26.00	26.00
Billets, open-hearth, Pittsburgh	26.00	26.00	26.00	26.00
Wire rods, Pittsburgh	36.00	36.00	36.00	35.00

	March 24, 1934	Feb. 1934	Dec. 1933	Mar. 1933
Pig Iron				
Besemer, del. Pittsburgh	19.26	19.26	19.26	15.76
Basic, valley	17.00	17.00	17.00	14.00
Basic, eastern, del. eastern Pa.	18.76	18.76	18.76	13.50
No. 2 foundry, del. Pittsburgh	18.76	18.76	18.76	15.76
No. 2 foundry, Chicago	17.50	17.50	17.50	15.50
Southern, No. 2, Birmingham	13.50	13.50	13.50	11.00
No. 2X, Eastern, del. Philadelphia	19.63	19.63	19.63	13.76
Malleable, valley	17.50	17.50	17.50	14.50
Malleable, Chicago	17.50	17.50	17.50	15.50
Lake Superior charcoal, del. Chi.	23.54	23.54	23.54	23.04
Gray forge, del. Pittsburgh	18.38	18.38	18.38	15.63
Ferromanganese, del. Pittsburgh	90.24	90.24	87.24	73.24
Scrap				
Heavy melting steel, Pittsburgh	$14.25	13.90	12.20	8.75
Heavy melting steel, eastern Pa.	11.75	11.75	10.25	6.50
Heavy melting steel, Chicago	12.00	10.90	9.00	5.25
No. 1 wrought, eastern Pa.	12.75	12.75	11.00	6.75
No. 1 wrought, Chicago	10.90	10.50	8.45	5.00
Rails for rolling, Chicago	12.75	11.90	10.35	7.95
Coke				
Connellsville, furnace, ovens	3.25	3.50	3.75	1.75
Connellsville, foundry, ovens	4.25	4.25	4.25	2.25

Steel, Iron, Raw Material and Metals Prices

Prices conform to American Iron and Steel institute schedules. Asterisks denote price changes this week

Sheet Steel

HOT ROLLED No. 10
(24 to 48 inches wide)

Pittsburgh, base	1.75c
Gary, base	1.85c
Chicago, del.	1.88c
New York, del.	2.08c
Philadelphia, del.	2.04c
Birmingham, base	1.90c
St. Louis, del.	2.07c
F.o.b. cars, dock, Pacific ports	2.42½c

HOT ROLLED ANN. No. 24

Pittsburgh, base	2.25c
Gary, base	2.35c
Chicago, del.	2.38c
Detroit, del.	2.45c
New York, del.	2.58c
Philadelphia, del.	2.54c
Birmingham, base	2.40c
St. Louis, del.	2.57c
F.o.b. cars, dock, Pacific ports	2.95c

GALVANIZED No. 24

Pittsburgh, base	2.85c
Gary, base	2.95c
Chicago, del.	2.98c
Philadelphia, del.	3.14c
New York, del.	3.18c
Birmingham, base	3.00c
St. Louis, del.	3.17c
San Francisco, f.o.b. cars, dock	3.55c

TIN MILL BLACK No. 28

Pittsburgh, base	2.65c
Gary, base	2.75c
St. Louis, del.	2.97c

COLD ROLLED No. 10

Pittsburgh, base	2.30c
Gary, base	2.40c
Detroit, delivered	2.50c
Philadelphia, del.	2.59c
New York, del.	2.63c

COLD ROLLED No. 20

Pittsburgh, base	2.75c
Gary, base	2.85c
Detroit, delivered	2.95c
Philadelphia, del.	3.04c
New York, del.	3.08c

ENAMELING SHEETS

Pittsburgh, No. 10	2.45c
Pittsburgh, No. 20	2.90c

Tin and Terne Plate

Per 100-lb. box, Pittsburgh. Gary base, 10 cents higher

Tin plate, coke base contract	$5.25
Do., stock	4.55
Long ternes, No. 24 unassorted	3.25c

Corrosion and Heat Resistant Alloys

Base, Pittsburgh

18% chrome, 8% nickel; sheets, 35c; plates, 28c; bars, 24c; hot-rolled strip, 24.50c; cold-rolled strip, 32.00c.

	A	B	C	D
Bars	17c	18.5c	21c	26c
Plates	20c	21.5c	24c	29c
Sheets	25c	28c	31c	35c
Hot strip	17c	18.5c	21c	26c
Cold strip	22.5c	24c	27c	35c

Carbon 0.12 and under; no nickel. A has chrome 15% and under. B over 15/18% inc., C over 19/23% inc., D over 23/30%.

Steel Plates

Pittsburgh, base	1.70c
New York, del.	1.98c
Philadelphia, del.	1.88½c
Boston, del.	2.10c
Buffalo, del.	1.93½c
Chicago, base	1.75c
Cleveland, del.	1.88½c
Birmingham, base	1.85c
Coatesville, base	1.80c
Sparrows Pt., base	1.80c
Pacific Coast, f.o.b. cars, dock	2.25c
St. Louis, del.	1.97c

Structural Shapes

Pittsburgh, base	1.70c
Philadelphia, del.	1.90½c
New York, del.	1.95½c
Boston, del.	2.08½c
Bethlehem, base	1.80c
Chicago, base	1.75c
Cleveland, del.	1.88½c
Buffalo, base	1.80c
Birmingham, base	1.85c
Pacific Coast, f.o.b. cars, dock	2.25c

Bars

SOFT STEEL

Pittsburgh, base	1.75c
Chicago, base	1.80c
Birmingham, base	1.90c
Buffalo, base	1.85c
Cleveland, base	1.80c
Detroit, del.	1.90c
Pacific Coast ports, cars, dock, c.i.f.	2.30c
Philadelphia, del.	2.04c
Boston, del.	2.15c
New York, del.	2.08c
Pitts., forg. qual.	1.75c-2.25c

RAIL STEEL
To Manufacturing Trade

Pittsburgh	1 65c
Chicago	1.70c
Cleveland	1.70c
Gary, Ind.	1.70c
Buffalo	1.75c

IRON

Terre Haute, Ind. base	1.60c
Philadelphia, base..	1.74c
Pittsburgh, refined..	2.75c-7.50c

REINFORCING
New billet, cut lengths, carlots

Pittsburgh	1.90c
Chicago, Gary, Buffalo, Cleve., Birm., Young...	1.95c
Gulf ports	2.30c
Pacific coast ports	2.45c
Philadelphia, del.	2.19c

Rail Steel

Pittsburgh, base	1.75c
Chicago, Buffalo, Cleveland, Birm., Young.	1.80c
Gulf ports	2.15c
Pacific coast ports	2.30c

Wire Products □ □

(Prices apply to straight or mixed carloads; pool cars, or less, 10c up. 10% dis. on nail extras on straight or mixed carloads to one consignee.)

Base, Pittsburgh-Cleveland (Per 100-lb. keg)

Standard wire nails	$2.35
Cement coated nails	2.35
Galvanized nails, 15 gage and coarser	4.35c
Do., 16 gage and finer..	4.85c

(Per pound)

Polished staples	3.05c
Galvanized fence staples	3.30c
Barbed wire, galv.	2.85c
Annealed fence wire	2.35c
Galvanized fence wire....	2.70c
Woven wire fencing (base column, c.l.)	$60.00
Plain wire, 6-9 gage to mfg. trade	2.20c

Anderson, Ind., Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire	3.20c

Chicago and Waukegan $1 higher, Worcester $2 higher.

Cold-Finished Carbon Bars

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs.	2.10c
20,000 to 59,999 lbs.	2.05c
60,000 to 99,999 lbs.	2.00c
100,000 lbs. and over	1.97½c

Chicago, Cleveland, up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

Shafting □ □ □

Turned and ground, Pitts. base	
1⅛-inch	3.40c
1⅛ to 1½-inch	2.90c
1⅞ to 1⅞-inch	2.75c
1⅛ to 2⅞-inch	2.60c
2⅛ to 7-inch	2.45c

Alloy Steel Bars □

Hot Rolled

Pittsburgh, Buffalo, Chicago, Massillon, Canton	2.45c
Bethlehem	2.55c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 .15 to .25 Mo	0.50
4600 .20 to .30 Mo. 125-1.75 Ni.	1.05
5100 .80-1.10 Cr	0.45
5100 Cr. spring	base
6100 bars	1.20
6100 spring	0.70
Cr., Ni., Van	1.50
Carbon van.	0.95
9250.....carbon base plus extras	

Strip and Hoops □

Hot strip to 23⅛-in. Pittsburgh	1.75c
Do., Chicago	1.85c
Do., del. Detroit..	1.95c
Do., del. Phila....	2.04c
Do., del. N. Y.	2.08c
Cooperage hoop, Pittsburgh	1.85c
Do., Chicago	1.95c
Cold-rolled strip, Pitts., Cleve.	2.40c
Worcester	2.60c

Rails, Track Material □

(Gross Ton)

Standard rails, mill	$36.37½
Relay rails. Pitts. 20-45 lbs.	$26.00
50-60 lbs.	$23.00
70-75 lbs.	$18.00
80-85 lbs.	$25.00
100 lbs.	$26.00
Light rails, billet qual., Pitts., Chi.	$32.00
Do., reroll. qual....	$31.00
Angle bars, mills...	2.55c
Spikes, R. R. base..	2.40c
Track bolts, base....	3.55c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs., up $1; 12 lbs., up $2; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons or more; diff. for less.

Bolts and Nuts □ □

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots. Dec. 1, 1932, lists.

CARRIAGE BOLTS

All sizes, cut thread	70 off
Rolled thread, ½ x 6 and smaller	70 off

MACHINE BOLTS

All sizes, cut thread, lag	
Screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts, without nuts	70 off
Tire bolts	60 off
Stove bolts, 70-25-10 off in pkgs.; 83 off in bulk, 5000 or more of a size.	
Rolled thread machine bolts, ½ x 6 and smaller,	70 off
Step bolts	66 off
Elevator bolts	66 off

NUTS

Semifinished	70 off

HEXAGON CAP SCREWS

Milled	80-10-10 off
Upset 1-in., smaller	85 off

SQUARE HEAD SET Screws

Upset, 1-in., smaller	75-10 off
Upset, larger than 1-in.	75-10 off
Headless set screws	75 off

Rivets, Wrought Washers

Struc., c.l., Pittsburgh, Cleveland	2.75c
Struc., c.l., Chicago	2.85c
⅞-in. and smaller, Pitts., Chi., Cleve.	70 and 10 off
Wrought washers, Pitts., Chi., Phila.	6.00-6.25 off

Cut Nails, Piling □

Cut nails, Pitts:; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more; no discount on size extras	$3.05
Do., less than 5 kegs; no discount on size extras	$3.20
Steel piling, Pittsburgh	2.00c
Steel piling, Chi., Buff	2.10c

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago delivered 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD

In.	Blk.	Gal.
Steel		
¼ and ⅜	57	38½
½	62	50½
¾	65½	55½
1—3	67½	58½
Iron		
½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

LAP WELD

Steel		
2	63½	54½
2½—3	66½	57½
3½—6	68½	59½
7 and 8	67½	57½
9 and 10	67	57
Iron		
2	37	22½
2½—3½	38	25
4—8	40	28½

LINE PIPE

Steel	
⅛-inch, butt weld	50½
¼—⅜, butt weld	56
½, butt weld	61
¾, butt weld	64½
1—3, butt weld	66½
2-inch, lap weld	62½
2½—3, lap weld	65½
3½—6, lap weld	67½
7—8, lap weld	66½
Iron	

⅛—1½-inch, black and galv. take 4 pts. over; 2½—6-inch 2 pts. over discounts for same sizes, standard pipe lists. 8—12-inch, no extra.

BOILER TUBES

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¾—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 2000 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 pounds, two points under base only.

SEAMLESS BOILER TUBES

Cold Drawn			
2—2¼	27	3¼—3½	41
2½—2¾	34	4	43
3	38	4½, 5, 6	36

(On 1—1¾-inch sizes mechanical tubing dis. apply.)

Hot Rolled			
2—2¼	33	3¼—3½	47
2½—2¾	40	4	49
3	44	4½, 5, 6	42

Quantity discounts: Carload and more gets preferential of two 5%; 2000 to 9999 pounds, 10 points off base and one 5%; under 2000 pounds, 15 points under base and one 5%.

Seamless Tubing □

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe □

Class B Pipe- Pet Net Ton

6-in., & over, Birm.	$36.00-37.00
4-in., Birm.	39.00-40.00
4-in., Chicago	47.00-48.00
6 to 24-in., Chicago	44.00-45.00
6-in., & over, east. fdy.	40.00
Do., 4-in.	43.00

Class A pipe $3 over Class B.

Stnd. fitgs., Birm. base	$90.00

Six to 24-inch, fittings base; over 24-inch plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, 5 higher.

Semifinished Steel □

Prices Per Gross Ton

BILLETS AND BLOOMS
4 x 4-inch base

Pitts., Chi., Cleve., open-hth. & bess.	$26.00
Philadelphia	31.30
Forgings, Pitts., Chi.	31.00

SHEET BARS

Pitts., Cleve., Young.	26.00
Chicago	26.00
Canton, O.	26.00

SLABS

Pitts., Cleve., Young.	26.00

WIRE RODS

Pitts., Cleveland	36.00
Chicago	37.00

SKELP

All grades, Pitts., and Chicago	1.60c

Coke □ □ □

Price Per Net Ton

BEEHIVE OVENS

Connellsville fur.	$3.25- 3.50
Connellsville fdry.	4.25
Connell. prem. fdy.	5.00
New River fdry.	6.00
Wise county fdry.	4.25- 5.00
Wise county fur.	3.50- 4.25

BY-PRODUCT FOUNDRY

Newark, N. J., del.	8.71- 9.31
Chi., ov., outside del.	8.50
Chicago, del	9.25
New England, del.	10.50
St. Louis, del.	9.25
Birmingham, ovens	5.00
Indianapolis, del.	8.75
Cincinnati, del.	9.30
Cleveland, del.	9.25
Buffalo, ovens	7.50- 8.00
*Detroit, ovens	8.50
Philadelphia, del.	9.00

Coke By-Products □

Per gallon, producers' plants.

Tank lots

	Spot
Pure benzol	$0.205
90 per cent benzol..	$0.205
Toluol	0.30
Solvent naphtha	0.26
Commercial xylol	0.26

Per lb. f.o.b. New York

Phenol (200 lb. drums)..	0.163c
Do. (100 lbs.)	0.173

Eastern Plants, Per Pound, In Barrels

†Naphthalene flakes and balls	6.00

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.25

†Western prices ½-cent higher per pound.

Pig Iron

Delivered prices do not include switching charges except as noted. No. 2 foundry iron is 1.75-2.25 silicon; 25-cent differentials apply for each 0.25 silicon above 2.25. Gross tons.

	No. 2 Fdry.	Malleable	Basic	Bessemer
Basing Points:				
Bethlehem, Pa.	$18.50	$19.00	$18.00	$19.50
Birdsboro, Pa.	18.50	19.00	18.00	19.50
Swedeland, Pa.	18.50	19.00	18.00	19.50
Sparrows Point, Md.	18.50	.....	18.00	.....
From Swedeland, Pa., del. to Philadelphia	19.26	19.76	18.76	.....
From Bethlehem, del. to Brooklyn	20.77	21.27	.....	.....
From Bethlehem, del. to Newark, N. J.	19.99	20.39	.....	.....
Basing Point:				
Everett, Mass.	18.50	19.00	18.00	19.50
From Everett, del. to Boston	19.00	19.50	18.50	20.00
Basing Point:				
Buffalo	17.50	18.00	16.50	18.50
From Buffalo, del. to Boston	19.00	19.50	18.50	20.00
Basing Points:				
Neville Island, Pa.	18.00	18.00	17.00	18.50
Sharpsville, Pa.	17.50	17.50	17.00	18.00
Youngstown, O.	17.50	17.50	17.00	18.00
From Neville Island, Pa., del. to Pittsburgh district	(Neville Island base, plus 63c to $1.13 switching charges)			
Basing Points:				
Erie, Pa.	17.50	18.00	17.00	18.50
Cleveland	17.50	17.50	17.00	18.00
Toledo, O.	17.50	17.50	17.00	18.00
Detroit	17.50	17.50	17.00	18.00
From Detroit, del. to Saginaw, Mich.	19.60	19.60	19.10	20.10
From Cleveland, del. to Akron, Canton, O.	18.76	18.76	18.26	19.26
From Toledo, del. to Mansfield, O.	19.26	19.26	18.76	19.76
Basing Point:				
Jackson, O.	19.25	19.25	18.75	.....
Hamilton, O.	17.50	17.50	17.00	18.00
From Hamilton, del. to Cincinnati	18.51	18.51	18.01	19.01
Do., del. to Indianapolis	19.77	19.77	19.27	20.27
Basing Points:				
Duluth	18.00	18.00	.....	18.50
Chicago	17.50	17.50	17.00	18.00
Granite City, Ill.	17.50	18.00	17.00	.....
From Duluth, del. to St. Paul	19.94	19.94	.....	20.44
From Chicago, del. to Milwaukee	18.50	18.50	18.00	19.00
From Chicago, Toledo or Detroit, del. to Muskegon, Mich.	20.40	20.40	19.90	20.90
From Granite City, del. to St. Louis	18.00	18.50	17.50	.....
Basing Point:				
†Birmingham, Ala.	13.50	.....	12.50	18.00
From Birmingham, del. to:				
Boston	18.62	.....	18.12	.....
Newark, N. J.	19.58	.....	.....	.....
Brooklyn, N. Y.	20.39	.....	.....	.....
Baltimore	19.02	.....	18.52	.....
Philadelphia	18.88	.....	18.38	.....
Cleveland	17.62	.....	17.50	.....
Cincinnati	18.13	.....	17.51	.....
Chicago	*17.72	.....	17.60	.....
St. Louis	17.62	.....	17.50	.....

†Southern delivery only. Prices at northern points are adjusted to quotations on northern iron. *Over 0.70 phos.

Basing Point:
Provo, Utah ..... 16.50 ....

LOW PHOS.

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.—$23.00 Basing point: †Johnson City, Tenn.—$23.00
†Offgrade material is $19.

Philadelphia, standard and copper bearing 24.13

GRAY FORGE		CHARCOAL	
Valley furnace	17.25	Lake Superior fur.	20.50
Pitts. dist. fur.	17.75	Do., del. Chicago	23.54

SILVERY

Jackson county, O., base; 6%—$22.25; 7—$23.25; 8—$24.25; 9—$25.25; 10—$26.25; 11—$27.75.

BESSEMER FERROSILICON

Jackson County, O., base; 10%—$27.25; 11—$28.75; 12—$30.25; 13—$31.75; 14—$33.25; 15—$34.75; 16—$36.25.

Iron Ore □ □

LAKE SUPERIOR ORE
Gross ton, 51½%
Lower Lake Ports

Old range bessemer	$4.80
Mesabi bessemer	4.65
Old range nonbess.	4.65
Mesabi nonbess.	4.50
High phosphorus	4.40

EASTERN LOCAL ORES
Cents, unit, del. E. Pa.

Foundry and basic, 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-65% (nom.)	10.00-10.50

FOREIGN ORE
Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.	10.00
No. Afr. & low phos.	9.50
Swedish basic, 65%	9.00
Swedish low phos.	9.50
Spanish No. Africa basic, 50 to 60%	9.00
Tungsten, spot, sh. ton unit, duty pd.	$14.00-14.25
N. F. fdy., 55%	7.00
Chrome ore 48% gross ton, c.i.f.	$18.00

Manganese Ore □

(Nominal)

Prices, not including duty, cents per unit, cargo lots.

Caucasian, 52-55%	24.00
So. African, 52%	24.00
So. Afr., 49-51%	22.00
Indian, 58-50%	nominal
Indian, 48-50%	nominal

Refractories □ □

Per 1000 f.o.b. Works

FIRE CLAY BRICK
First Quality

Pa., Ohio, Ill., Ky., Md., Ga., Mo.	$45.00
Alabama	48.00
Second Quality	
Pa., Ohio, Ill., Ky., Md., Mo., Ga., Ala.	40.00
MALLEABLE BUNG BRICK	
all bases	50.00
SILICA BRICK	
Pennsylvania	$45.00
Joliet, E. Chicago	54.00
Birmingham, Ala.	52.00
MAGNESITE	
Dead burned grain, Chester, Pa., Baltimore bases, net	40.00
Domes, Chewelah, Wash., base	22.00

BASIC BRICK
Net ton, f.o.b. Baltimore, Plymouth, Meeting, Pa., Chester, Pa.

Magnesite brick	$65.00
Chrome brick	45.00
Chemically bonded magnesite	55.00

Fluorspar 85-5 □ □

*Washed gravel, duty paid, tide, net ton	$19.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads	$14.75-15.00

Ferroalloys □ □

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	85.00
del. Pittsburgh	90.24
Spiegeleisen, 19-20%, dom., fur., spot†	26.00
Ferrosilicon, 50%, freight all., cl.	77.50
Do., less carload	85.00
Do., 75 per cent.	126-130.00
Spot, $5 a ton higher.	
Silicomang., 2½ carb	90.00
2% carbon	95.00
1% carbon	105.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	10.00
Ferrotungsten, stand., lb. cont.	1.16- 1.25
Ferrovanadium, 35 to 40%, lb. cont., on analysis	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt., allow., lb.	7.00
Do., under 1 ton	7.50
Ferrophosphorus, per ton, c. l., 17-19%, Rockdale, Tenn., basis, 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	65.00
Ferromolybdenum, stand. 50-60%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads. Quan. diff. apply.

Nonferrous Mill Products

F.o.b. mill base, cents per lb. except as specified. Copper, brass products based on 8.25c Conn. copper

Sheets	
Yellow brass (high)	13.75
Copper, hot rolled	15.00
Lead, cut, to jobbers	7.75
Zinc, 100-lb. base	9.00
Tubes and Pipes	
High yellow brass	16.25
Seamless copper	16.25
Rods	
High yellow brass	12.25
Copper, hot rolled	12.25
Anodes	
Copper, untrimmed	12.75
Wire	
Yellow brass (high)	14.25

Old Metals □ □

Deal. buying prices, cents lb.

No. 1 Composition Red Brass	
New York	4.50- 4.75
Chicago	4.37½-4.87½
Cleveland	5.00- 5.25
St. Louis	4.75- 5.00
Heavy Copper and Wire	
New York	6.12½- 6.25
Chicago, No. 1	5.75- 6.00
Cleveland	5.50- 5.75
St. Louis	5.75- 6.00
Composition Brass Borings	
New York	4.25- 4.50
Light Copper	
New York	5.25- 5.50
Chicago	4.50- 4.75
Cleveland	5.00- 5.25
St. Louis	4.75- 5.00
Light Brass	
Chicago	2.50- 2.75
Cleveland	3.00- 3.25
Lead	
New York	3.00- 3.25
Cleveland	3.00- 3.25
Chicago	2.75- 3.00
St. Louis	3.10- 3.25
Zinc	
New York	2.25- 2.50
Cleveland	2.25- 2.65
Chicago	2.25- 2.50
St. Louis	2.75- 3.00
Aluminum	
Clips, soft, Cleve.	13.00-14.00
*Borings, Cleveland	7.00- 7.50
Mixed, cast, Cleve.	11.00-11.25
Mixed, cast, St. L.	11.75-12.25

Secondary Metals □

Brass ingot, 85-5-5-5	8.25
Remelt al. No. 12	15.50-16.00

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL □

Birmingham	9.50-10.50
Boston, dealers	7.75- 8.00
Buffalo, No. 1	12.75-13.25
Buffalo, No. 2	11.25-11.75
Chicago	11.75-12.25
Cleveland, No. 1	12.00-12.50
Cleveland, No. 2	11.50-12.00
Detroit, No. 1	10.00-10.50
Detroit, No. 2	9.00- 9.50
Eastern Pa.	11.50-12.00
Eastern Pa., No. 2	9.50
Federal, Ill.	9.25- 9.75
Granite City, Ill.	9.50-10.00
N. Y., deal. R. R.	9.50
N. Y., deal. No. 2	8.00
Pittsburgh, No. 1	14.00-14.50
St. Louis, No. 1 del.	10.00-10.50
Valleys, No. 1	14.50-15.00

COMPRESSED SHEETS □

Buffalo, dealers	11.25-11.75
Chicago, factory	11.00-11.50
Cleveland	11.00-11.50
Detroit	10.00-10.50
E. Pa., new mat.	10.50
Pittsburgh	14.00-14.50
St. Louis	9.00- 9.50
Valleys	14.00-14.50

BUNDLED SHEETS □ □

Buffalo	7.50- 8.00
Cincinnati, del.	7.50- 8.00
Cleveland	8.50- 9.00
Pittsburgh	12.50-13.00
St. Louis	6.00- 6.50

SHEET CLIPPINGS LOOSE □

Chicago	6.50- 7.00
Cincinnati	7.00- 7.50
Detroit	7.00- 7.50
St. Louis	5.50- 6.00

STEEL RAILS, SHORT □

Birmingham	12.00-12.50
Boston, dealers	7.75- 8.00
Buffalo	13.75-14.25
Chicago (3 ft.)	12.50-13.00
Chicago (2 ft.)	13.50-14.00
Cincinnati, del.	13.00-13.50
Detroit	11.50-12.00
Pitts., (open-hearth 3 ft. and less	15.75-16.25
St. Louis	12.50-13.00

STOVE PLATE

Birmingham	6.50- 7.50
Boston, dealers	4.75- 5.00
Buffalo	10.75-11.25
Chicago, net	7.75- 8.25
Cincinnati, dealers	7.00- 7.50
Detroit, net	7.50- 8.00
Eastern Pa.	8.50- 9.00
N. Y., deal. fdry.	6.00
St. Louis	6.50- 7.00

COUPLERS, SPRINGS □

Buffalo	13.00-14.00
Chicago, springs	12.50-13.00
Eastern Pa.	15.50
Pittsburgh	16.00-16.25
St. Louis	12.00-12.50

ANGLE BARS—STEEL □

Chicago	12.50-13.00
St. Louis	10.00-10.50

LOW PHOSPHORUS □ □

Buffalo, billets and bloom crops	13.75-14.25
Cleveland, billet, bloom crops	14.00-14.50
Eastern Pa. crops	14.00-14.50
Pittsburgh, billet, bloom crops	17.00-17.50
Pittsburgh, sheet bar crops	16.00-16.50

FROGS, SWITCHES □ □

Chicago	11.75-12.25
St. Louis	9.50-10.00

SHOVELING STEEL □ □

Chicago	11.75-12.25
St. Louis	9.25- 9.75

RAILROAD WROUGHT □

Birmingham	7.00- 8.00
Boston, dealers	6.00- 6.50
Buffalo, No. 1	9.75-10.25
Buffalo, No. 2	12.75-13.25
Chicago, No. 1, net	9.50-10.00
Chicago, No. 2	11.75-12.25
Cincinnati, No. 2	10.00-10.50
Eastern Pa.	12.50-13.00
N. Y., No. 1 deal	8.00- 8.50
St. Louis, No. 1	6.00- 6.50
St. Louis, No. 2	9.50-10.00

SPECIFICATION PIPE □

Boston	4.50- 4.75
Eastern Pa.	9.50
New York, dealers	5.25- 5.50

BUSHELING □ □

Buffalo, No. 1	11.25-11.75
Chicago, No. 1	10.75-11.00
Cinci., No. 1 deal	6.50- 7.00
Cincinnati, No. 2	4.50- 5.00
Cleveland, No. 2	9.00- 9.50
Detroit, No. 1 new	9.00- 9.50
St. Louis, No. 1	7.00- 7.50
Valleys, new No. 1	14.00-14.50

MACHINE TURNINGS □

Bimingham	4.50- 5.00
Boston, dealers	4.00- 4.25
Buffalo	7.25- 7.75
Chicago	7.50- 8.00
Cincinnati, dealers	6.00- 6.50
Cleveland	9.00- 9.50
Detroit	7.00- 7.50
Eastern Pa.	7.50
New York, dealers	3.25- 3.50
Pittsburgh	10.75-11.25
St. Louis	5.25- 5.75
Valleys	12.00-12.50

BORINGS AND TURNINGS □

For Blast Furnace Use

Boston, dealers	3.25- 3.50
Buffalo	7.75- 8.25
Cincinnati, dealers	6.00- 6.50
Cleveland	9.00- 9.50
Detroit	8.00- 8.50
Eastern Pa.	6.50
New York, dealers	2.00- 2.50
Pittsburgh	8.50- 9.00

CAST IRON BORINGS □ □

Birmingham, plain	4.50- 5.00
Boston, chemical	8.50- 9.00
Boston, dealers	3.25- 3.50
Buffalo	7.50- 8.00
Chicago	7.75- 8.25
Cincinnati, dealers	6.00- 6.50
Cleveland	9.00- 9.50
Detroit	8.00- 8.50
E. Pa., chemical	12.00-15.00
New York, dealers	3.00- 3.50
Pittsburgh	8.50- 9.00
St. Louis	5.25- 5.75

PIPE AND FLUES □ □

Cincinnati, dealers	4.50- 5.00

RAILROAD GRATE BARS □

Buffalo	7.00- 7.50
Chicago, net	7.50- 8.00
Cincinnati	6.00- 6.50
Eastern Pa.	8.50- 9.00
New York, dealers	5.00- 5.50
St. Louis	6.00- 6.50

FORGE FLASHINGS □ □

Boston, dealers	6.00- 6.50
Buffalo	11.25-11.75
Cleve., over 10 in.	9.25- 9.75
Detroit	8.75- 9.25

FORGE SCRAP □ □

Boston, dealers	5.00- 6.00
Chicago, heavy	12.50-13.00
Eastern Pa.	10.50-11.00

ARCH BARS, TRANSOMS □

St. Louis	10.50-11.00

AXLE TURNINGS □ □

Boston, dealers	4.50- 5.00
Buffalo	9.00- 9.50
Chicago, elec. fur	10.50-11.00
Cleveland	9.50-10.00
Eastern Pa.	11.00
St. Louis	6.00- 6.50

STEEL CAR AXLES □ □

Birmingham	11.00-11.50
Boston, ship. point	8.00- 8.50
Buffalo	13.00 13.50
Chicago, net	12.00-12.50
Eastern Pa.	14.00
St. Louis	10.50-11.00

SHAFTING □ □

Boston, ship. point	11.00-11.25
Eastern Pa.	16.25
New York, dealers	11.50-12.00
St. Louis	10.00-10.50

CAR WHEELS □ □

Birmingham, iron	9.00- 9.50
Boston, iron deal	6.50- 6.75
Buffalo, iron	12.25-12.75
Buffalo, steel	13.25-13.75
Chicago, iron	12.25-12.75
Chicago, rolled steel	12.50-13.00
Cincinnati, iron	10.25-10.50
Eastern Pa., iron	13.50-14.00
Eastern Pa., steel	15.00-15.50
Pittsburgh, iron	13.00-13.50
Pittsburgh, steel	16.00-16.50
St. Louis, iron	9.50-10.00
St. Louis, steel	10.00-10.50

NO. 1 CAST SCRAP □ □

Birmingham	9.00- 9.50
Boston, No. 2	6.00- 6.25
Boston, tex. con.	10.50-11.00
Buffalo, cupola	12.00-12.50
Buffalo, mach.	13.25-13.75
Chicago, agri. net	8.50- 9.00
Chicago, mach. net	9.00-10.00
Chi., railroad net	9.00- 9.50
Cinci., mach. cup	10.75-11.25
Cleveland, cupola	11.50-12.50
Detroit, net	10.00-10.50
Eastern Pa., cupola	12.50-13.00
Pittsburgh, cupola	13.00-13.50
San Francisco, del.	13.50-14.00
Seattle	7.00- 8.50
St. Louis, No. 1	9.00- 9.50
St. L., No. 1 mach.	10.00-10.50

HEAVY CAST □ □

Boston, del.	6.75- 7.00
Buffalo, break.	9.00- 9.50
Cleveland, break.	8.50- 9.00
Detroit, break	9.00- 9.50
Detroit, auto net	11.00-11.50
Eastern Pa.	12.00
N. Y., No. 1, deal	8.00- 8.50
N. Y., break. deal	8.00- 8.50
Pittsburgh	12.00-12.50

MALLEABLE □ □

Boston, consum.	12.50-13.00
Buffalo	13.25-13.75
Chicago, R. R.	12.25-12.75
Cincinnati, agri. del.	9.75-10.25
Cinci., R. R. del.	10.50-11.00
Cleveland, rail.	13.00-13.50
Detroit, auto	9.75-10.25
St. Louis, R. R.	9.75-10.25
Eastern Pa., R. R.	11.50-12.50

RAILS FOR ROLLING □

5 feet and over

Birmingham	11.00-11.50
Boston, dealers	7.75- 8.00
Buffalo	11.75-12.25
Chicago	12.50-13.00
Eastern Pa.	13.00
New York, dealer	7.50- 8.00
St. Louis	11.00-11.50

LOCOMOTIVE TIRES □

Chicago (cut)	12.50-13.00
St. Louis, No. 1	9.50-10.00

LOW PHOS. PUNCHINGS □

Buffalo	13.75-14.25
Chicago	12.50-13.00
Eastern Pa.	14.50-15.00
Pittsburgh	16.00-16.50

Nonferrous Metal Prices of the Week

Spot unless otherwise specified. Cents per pound

	Copper: Electro., del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin, New York: Spot	Straits Tin, New York: Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 98-99%	Antimony Spot, N. Y.	Ingot Nickel
March 17	8.00	8.12½	7.75	53.75	53.80	4.00	3.90	4.37½	*22.90	7.65	36.00
March 19	8.00	8.12½	7.75	53.65	53.70	4.00	3.90	4.37½	*22.90	7.65	36.00
March 20	8.00	8.12½	7.75	54.12½	54.17½	4.00	3.90	4.37½	*22.90	7.65	36.00
March 21	8.00	8.12½	7.75	54.00	54.05	4.00	3.90	4.37½	*22.90	7.65	36.00
March 22	8.00	8.12½	7.75	54.12½	54.17½	4.00	3.90	4.35	*22.90	7.65	36.00
March 23	8.00	8.12½	7.75	54.37½	54.42½	4.00	3.90	4.35	*22.90	7.65	36.00
March 23	8.00	8.12½	7.75	54.30	54.35	4.00	3.90	4.35	*22.90	7.60	36.00

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS	□
Baltimore*	2.75c
Boston††	2.90c
Buffalo	2.95c
Chattanooga	3.26c
Chicago	2.90c
Cincinnati	3.10c
Cleveland	2.90c
Detroit	2.98½c
Houston	3.00c
Los Angeles	3.40c
New Orleans	3.00c
New York‡(d)	3.17c
Pittsburgh	2.85c
Philadelphia*	2.75c
San Francisco	3.55c
Seattle	3.40c
St. Louis	3.14c
St. Paul	3.00c
Tulsa	3.25c

IRON BARS	□
Portland	3.40c
Baltimore*	2.60c
Chattanooga	3.26c
Chicago	2.75c
Cincinnati	3.10c
Detroit	2.98½c
New York‡(d)	3.10c
Philadelphia*	2.75c
St. Louis	3.14c
Tulsa	3.25c

REINFORC. BARS	□
Boston	2.75c-3.25c
Buffalo	1.95c
Chattanooga	3.26c
Chicago	1.95c-2.10c
Cleveland (c)	1.97½c
Cincinnati	3.10c
Houston	3.25c
Los Ang., cl.	2.15c
New Orleans	3.00c
New York	3.17c
Philadelphia	2.62½c
Pitts., plain	3.00c
Pitts., twisted squares	3.12½c
San Francisco	2.45c
Seattle	2.45c
St. Louis	3.29c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES	□
Baltimore*	2.75c
Boston††	3.07c
Buffalo	3.20c
Chattanooga	3.46c
Chicago	3.10c
Cincinnati	3.30c
Cleveland	3.21c
Detroit	3.30c
Houston	3.00c
Los Angeles	3.40c
New Orleans	3.50c
New York(d)	3.27c
Philadelphia*	2.75c
Pittsburgh	3.05c
Portland	3.40c
San Francisco	3.50c
Seattle	3.40c
St. Louis	3.34c
St. Paul	3.25c
Tulsa	3.50c

PLATES	□
Baltimore*	2.75c
Boston††	3.08c
Buffalo	3.20c
Chattanooga	3.46c
Chicago	3.10c
Cincinnati	3.30c
Cleveland, ¼-in. and thicker	3.21c
Cleve., ⅜-in.	3.20c
Detroit	3.30c
Detroit, ⅜-in.	3.10c
Houston	3.00c
Los Angeles	3.40c
New Orleans	3.50c
New York(d)	3.30c
Philadelphia*	2.75c
Phila. floor	4.35c
Pittsburgh	3.05c
Portland	3.40c
San Francisco	3.50c
Seattle	3.40c
St. Louis	3.34c
St. Paul	3.25c
Tulsa	3.50c

NO. 10 BLUE	□
Baltimore*	2.95c
Boston††	3.15c
Buffalo	3.10c
Chattanooga	3.26c
Chicago	2.95c
Cincinnati	3.10c
Cleveland	3.01c
Det., 8-10 ga.	3.03½c
Houston	3.35c
Los Angeles	3.65c
New Orleans	3.50c
New York	3.17c
Portland	3.65c
Philadelphia*	2.95c
Pittsburgh	2.85c
San Francisco	3.75c
Seattle	3.65c
St Louis	3.19c-3.36c
St. Paul	3.45c
Tulsa	3.70c

NO. 24 BLACK	□
Baltimore*†	3.50c
Boston (g)	3.75c
Buffalo	3.25c
Chattanooga	4.01c
Chicago	3.70c
Cincinnati	3.85c
Cleveland	3.76c
Detroit	3.78½c
Los Angeles	4.15c
New York	3.65c
Philadelphia*†	3.40c
Pittsburgh**	3.40c
Portland	4.25c
San Francisco	4.25c
Seattle	4.25c
St. Louis	3.94c
St. Paul	3.695c
Tulsa	4.75c

NO. 24 GAL. SHEETS	□
Baltimore*†	3.75c
Buffalo	4.00c
Boston (g)	4.35c
Chattanooga	4.61c
Chicago	4.20c-4.30c
Cincinnati	4.45c
Cleveland	4.36c
Detroit	4.45c
Houston	4.40c
Los Angeles	4.75c
New Orleans	4.35c
New York	4.25c
Pitts.**	3.90c-4.20c
Portland	4.85c
San Francisco	4.85c
Seattle	4.85c
St. Louis	4.54c
St. Paul	4.19c
Tulsa	5.10c
Philadelphia*†	4.00c

BANDS	□
Baltimore	3.05c
Boston††	3.15c
Buffalo	3.30c
Chattanooga	3.51c
Chicago	3.20c
Cincinnati	3.35c
Cleveland	3.26c
Detroit, ⅜-in. and lighter	3.28½c
Houston	3.25c
Los Angeles	3.90c
New Orleans	3.20c
New York(d)	3.42c
Philadelphia	3.05c
Pittsburgh	3.10c
Portland	3.90c
San Francisco	4.05c
Seattle	3.90c
St. Paul	3.20c
Tulsa	3.45c
St. Louis	3.44c

HOOPS	□
Baltimore	2.80c
Boston	4.15c
Buffalo	3.55c
Chicago	3.20c
Cincinnati	3.35c
Det., No. 14 and lighter	3.28½c
New York	3.42c
Philadelphia	3.30c
Pittsburgh	3.60c
Seattle	5.40c
St. Paul	3.75c

COLD FIN. STEEL	□
Baltimore (c)	3.71c
Boston	4.00c-4.50c
Buffalo (h)	3.55c
Chattanooga*	4.06c
Chicago (h)	3.50c
Cincinnati	3.70c
Cleveland (h)	3.50c
Detroit	3.63½c
Los Ang.(f)(d)	5.95c
New Orleans	4.25c
New York	3.92c-4.42c
Philadelphia	3.73c
Pittsburgh(h)	3.45c
Portland (f)	4.75c
San Fran.(f)(d)	5.95c
Seattle (f)(d)	4.75c
St. Paul	3.20c
St. Louis	3.74c
Tulsa	4.65c

COLD ROLL. STRIP	□
Boston, 0.100-in., 500 lb. lots	5.20c
Buffalo	5.25c
Chicago (b)	5.65c
Cincinnati	5.80c
Cleveland (b)	5.55c
Detroit	5.40c
Philadelphia	4.00c
New York	4.55c
St. Louis	5.74c

(b) Net base, straightening, cutting, boxing, 1 ton or more.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff.
(e) New mill classif.
(f) Rounds only.
(g) 50 bundles or over.
(h) Outside delivery, 10c less.

‡Domestic bars.
*Plus quan. extras.
**Under 25 bundles.
*†50 or more bundles.
†New extras apply.
††Base 40,000 lbs. extras on less.

Prices at Detroit, Cleveland, Chicago, Pittsburgh, Cincinnati, Chattanooga, New York, Boston, St. Louis on heavier lines are subject to new quantity differentials:

399 pounds and less, up 50 cents; 400 to 9999 pounds, base; 10,000 to 19,999 pounds, 15 cents under; 20,000 to 39,999 pounds, 25 cents under; 40,000 pounds and over, 35 cents under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Mar. 22

Export Prices f. o. b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports £ s d		Continental Channel or North Sea ports, metric tons Gold parity, $4.8665 £ s d	£ s d
PIG IRON				
Foundry, 2.50-3.00 Silicon.	$14.95	2 18 6	$8.52	1 15 0
Basic bessemer	13.80	2 14 0*	7.30	1 10 0
Hematite, Phos. .03-.05	16.74	3 5 6	....	.....
SEMIFINISHED STEEL				
Billets	$28.11	5 10 0	$11.44	2 7 0
Wire rods, No. 5 gage	39.86	7 16 0	21.90	4 10 0
FINISHED STEEL				
Standard rails	$39.60	7 15 0	$26.77	5 10 0
Merchant bars	1.65c	7 5 0	.69c to .72c	3 2 6 to 3 5 0
Structural shapes	1.68c	7 7 6	.63c	2 17 6
Plates, †¼ in. or 5 mm.	1.82c	8 0 0	.91c	4 2 6
Sheets, black, 24 gage or 0.5 mm.	2.11c	9 5 0	1.27c to 1.29c	5 15 0 to 5 17 6
Sheets, gal., 24 gage, corr.	2.57c	11 5 0	1.43c	6 10 0
Bands and strips	1.88c	8 5 0	.88c	4 0 0
Plain wire, base	2.22c	9 15 0	1.18c	5 7 6
Galvanized wire, base	2.62c	11 10 0	1.38c to 1.40c	6 5 6 to 6 7 6
Wire nails, base	2.74c	12 0 0	1.27c	5 15 0
Tin plate, box 108 lbs.	$ 4.21	0 16 6	....	.....

British ferromanganese $85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d 4($3.74) f.o.b.

Domestic Prices at Works o. Furnace—Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks	
Fdy. pig iron, Si. 2.5	$17.25	3 7 6(a)	$13.22	200	$14.27	305	$25.09	63
Basic bessemer pig iron	16.61	3 5 0(a)*	12.23	185	13.81	295	27.67 (b)	69.50
Furnace coke	4.47	0 17 6	7.93	120	5.14	110	7.67	19.25
Billets	28.11	5 10 0	28.42	430	20.59	440	38.43	96.50
Standard rails	1.88c	8 5 0	2.10c	700	2.31c	1,100	2.39c	132
Merchant bars	1.96c	8 12 0	1.68c	560	1.16c	550	1.99c	110
Structural shapes	2.00c	8 15 0	1.65c	550	1.16c	550	1.95c	107.50
Plates, †¼-in. or 5 mm.	1.97c	8 12 6	2.10c	700	1.47c	700	2.30c	127
Sheets, black	2.34c	10 5 0§	2.55c	850‡	1.63c	775‡	2.61c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	2.91c	12 15 0	4.50c	1,500	3.15c	1,500	6.70c	370
Plain wire	2.22c	9 15 0	3.39c	1,130	2.31c	1,100	3.13c	173
Bands and strips	2.39c	10 10 0	1.95c	650	1.47c	700	2.30c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel. (a) del. Middlesbrough. (b) hematite

Bars

Bar Prices, Page 58

Pittsburgh—The bar market reflects a cautious attitude on the part of most buyers, with few willing to make commitments far in advance. Soft steel bars are 1.75c, Pittsburgh. There is little feature in the alloy bar market, at 2.45c, base, Pittsburgh. Specifications have eased somewhat.

Cleveland—Divergent trends are noted in the market for future requirements. While some consumers are waiting the outcome of the labor issue before placing contracts for second quarter, others appear eager to protect themselves, believing any change in steel prices during that period will be upward. Actual orders to leading interests here during the week increased, with 75 per cent of the tonnage related to automobile manufacture. Some good specifications have been received for bars and plates for freight car and locomotive construction.

Chicago—Automotive demand for steel bars has slackened only moderately and shipments and specifications are holding close to recent peak levels. Changes are expected to depend largely on the outcome of the labor situation. Miscellaneous consumers show little change in specifications. New inquiry is fairly active and second quarter contracting is increasing. Prices remain 1.80c, Chicago, for soft steel bars, 1.70c for rail steel and 1.60c, Terre Haute, Ind., for bar iron.

Boston—Railroads will take a heavier volume of bars next quarter, according to present outlook. Small tool and industrial needs account for much of the present light volume. Prices are unchanged at 2.15c, Boston, delivered.

New York—Railroad and equipment specifications are buoying steel bar tonnage. Car builders are specifying more freely and carriers are covering second quarter requirements. New York Central opens bids under the Clayton act, March 27. General consuming demand, however, has shown little improvement and contracting is slow. Prices are steady at 1.75c, Pittsburgh, or 2.08c, New York.

Philadelphia—Steel bars are quiet at 2.04c, Philadelphia, but second quarter contracting is more active and railroad releases are increasing.

The roll turning department of the American Rolling Mill Co., Middletown, O., on Feb. 18 completed 18 years without a single lost-time accident. This department employs 20 men.

Plates

Plate Prices, Page 58

Pittsburgh—Further river barge buying is delayed although prospective buyers still show interest with inquiry for petroleum-carrying barges still the most active. In the meantime, government inquiry is fair, the latest job requiring about 325 tons, mainly ⅜ and 5/16-inch plates for a Memphis, Tenn., dredge hull, April 10. Bids will be taken March 29 on a steel oil barge, 100 tons, for New Orleans engineers. Plates continue 1.70c, Pittsburgh.

Cleveland—A little more activity is noted in plates, with a fairly good run of small, miscellaneous orders. The Cleveland plate mills operated at 55 per cent last week. Additional releases for Van Sweringen lines' freight cars are noted, and the Erie and Chesapeake & Ohio have taken bids on unstated tonnages covering their second quarter requirements for plates, shapes and bars.

Chicago—Plate inquiry is more active, aided by some demand for railroad equipment repairs. Little improvement is noted in needs of tank fabricators despite a fair volume of potential business. Plates continue 1.75c, Chicago.

Boston—Plate specifications and buying hold fairly well. The outlook for a better tonnage in the second quarter is encouraging. The Worcester, Mass., car shop, long inactive, has taken 50 coaches, requiring a sizable tonnage of plates.

New York—Substantial buying of steel plates by oil companies is accumulating while these consumers delay placing tonnage. Railroad equipment and repair releases are better than expected.

Philadelphia — Plate tonnage is light except for railroad releases though general consumers show a disposition to contract more freely. Five Chilean locomotives awarded the Baldwin Locomotive Co., Eddystone, Pa., will require about 200 tons of plates. The price is 1.88½c, Philadelphia.

Contracts Placed

500 tons, four barges, for floating concrete mixing equipment for construction of General Joe Wheeler dam, Tennessee valley authority, to Ingalls Iron Works Co., Birmingham, Ala.; Blaw-Knox Co., Pittsburgh, awarded bins, conveyor, batcher and tanks, at $31,852.

462 tons, 20 and 22-inch, 10 and 12 gage pipe for Redlands, Calif.; Consolidated Steel Corp., Los Angeles, 275 tons; and Southern Pipe & Casing Co., Los Angeles, 187 tons.

410 tons, high tensile vanadium steel plates for Philadelphia navy yard, schedule 900-7392, to Lukens Steel Co., Coatesville, Pa.

410 tons, high tensile vanadium steel plates for Brooklyn navy yard, to Bethlehem Steel Co., Bethlehem, Pa.

275 tons, for boilers, superheaters and equipment, naval academy, Annapolis, Md., to Babcock & Wilcox Co., New York.

250 tons, for 100 pontoons for Port of Portland to Columbia Steel Co., San Francisco; contract for fabrication to King Bros., Portland, Oreg.

165 tons, water tank, Williamsburg, Va., to R. D. Cole Mfg. Co., Newnan, Ga.

Unstated tonnage, 100,000-gallon water tank, Sardis, Miss., to Chicago Bridge & Iron Works, Chicago.

Unstated, including steel sheet piling, canal improvement for Washington Pulp & Paper Co., Port Angeles, Wash.; contract to Owens Bros., Port Angeles, Wash.

Contracts Pending

5085 tons, medium black and galvanized plates, sheets and strip, coast guard cutters, navy, for delivery at Brooklyn, Philadelphia and Charleston, S. C.; bids March 20.

4500 tons, plates, shapes and bars, second quarter's requirements, Norfolk & Western; bids March 28.

325 tons, mostly ⅜ and 5/16-inch plates, dredge hull 172 x 44 x 8¼ feet, for Memphis, Tenn., engineers; bids April 10.

250 tons, two 55-ton switching locomotives, Mare Island, Calif.; bids opened.

200 tons, for five locomotives for Chile being built by Baldwin Locomotive Works, Eddystone, Pa.

110 tons, lighthouse tender RHODODENDRON; Lake Washington Shipyards, Seattle, low.

140 tons, tunnel lining, Casper canal, Casper, Wyo.; bids opened.

100 tons, plates and shapes, water tank for Painesville, O.; bids in April.

Sheets

Sheet Prices, Page 58

Pittsburgh—Although the average of sheet mill operations last week was estimated at 55 per cent for the industry, this is receding because of certain suspensions due to labor difficulties. On the other hand, there has been some slight buying for immediate delivery to automobile companies. Demand is steady from the building industry, manufacturers of electrical motors and small tanks. Primes are steady at 2.85c, Pittsburgh, for galvanized; 2.25c for black; and 1.75c for heavy hot-rolled. Cold-rolled sheets hold at 2.30c and 2.75c, for Nos. 10 and 20 gages, respectively.

The Pennsylvania railroad has distributed about 3500 tons of sheets for car roofs largely among mills here.

Cleveland—Automotive sheet demand has held up surprisingly well

considering the uncertainties of the labor situation in that industry. Neither General Motors nor Ford has suspended specifications or shipments. Sheet mill operations here and in an adjacent lake district serving the Michigan automobile companies continue near capacity. The latter could run three weeks full without receiving any additional releases. In Cleveland and nearby, strike threats have not interfered with demand and shipments. The refrigerator manufacturers are near the seasonal peak of production; barrelmakers are taking relatively little material. Light contracting for second quarter is general.

Boston—A slightly better demand for sheets for miscellaneous building is noted. Jobbers manifest a little interest in second quarter requirements.

New York—An attempt to establish a grade competitive with the so-called Ford breakdown special is seen in a 2.65c Pittsburgh price reported to be made effective shortly by at least one producer, on No. 20 gage mill-run cold rolled sheets. This would compare with 2.75c, Pittsburgh, on No. 20 prime cold rolled sheets, with a certain percentage of seconds permissible with an order. The trade believes this purposed price would be limited mainly to automotive requirements. Fearing the spread of labor difficulties to the steel industry some consumers are buying more freely, and also requesting quicker shipments on contracts.

Cincinnati—Sheet mills in this district have not received any cancellations, and shipments are at the level of the past two or three weeks. New buying is light in the automotive field, this being attributed to labor difficulties. Production is steady at near 70 per cent.

St. Louis—Sheet orders and specifications so far this month show a substantial gain over the comparable period in February. Refrigerator business is above expectations.

Railroads

Track Material Prices, Page 59

Rails and fastenings placed during the past week and those which probably will be awarded this week give a total of 151,000 tons of steel for mills to add to their backlog. Chicago, Milwakee, St. Paul & Pacific has awarded 20,000 tons of rails and 27,000 tons of fastenings and Illinois Central has placed 20,000 tons of rails.

New York Central took bids April 20 on 40,000 tons of rails and an additional tonnage of fastenings, under the Clayton act, and should distribute them within ten days of that date. The Erie is about to place 32,000 tons of rails and 12,000 tons of fastenings.

American Iron and Steel institute has announced that delivery date on steel rails, angle bars, rail joints, tie plates and track spikes has been extended from July 1 to Aug. 31 on sales made before April 15.

Considerable tonnage of various steel products will be covered in inquiries now current. New York Central will open bids March 27 under the Clayton act for miscellaneous requirements. This road has opened bids on various warehouse items and nails for second quarter.

The Pennsylvania takes bids March 26 on miscellaneous items for second quarter, probably totaling about 5000 tons. Norfolk & Western is inquiring for 4500 tons of plates, shapes and bars for second quarter. Erie and Chesapeake & Ohio have opened bids for second quarter requirements of plates, shapes and bars.

Union Pacific Co., Denver, subsidiary of the Union Pacific, has placed 400 small steel coal cars with Watt Car & Wheel Co., Barnesville, O., requiring about 400 tons of steel, which has been placed with the Wheeling Steel Corp., Wheeling, W. Va. Chicago, Milwaukee, St. Paul & Pacific has ordered 300 automobile unloaders from Evans Products Co., Detroit.

While recent car buying has been light it is expected the Lackawanna will close for at least 500 freight cars, the Erie for 50 bulk cement cars and eight coaches and the Western Maryland for 20 cabooses, all during March. The Boston & Maine list of 31 coaches is expected to go over to April.

PWA has formally approved a contract with the Erie for a loan of $2,671,000, which will be used for the purchase of 32,121 tons of rails and a tonnage of fastenings. Releases by the Pennsylvania for its car repair program have exceeded expectation of mills.

Car Orders Placed

Union Pacific Co., Denver, 400 small steel coal cars, to Watt Car & Wheel Co., Barnesville, O.

Locomotives Placed

Chilean State railways, five locomotives, to Baldwin Locomotive Works, Eddystone, Pa.

Rail Orders Placed

Chicago, Milwaukee, St. Paul & Pacific, 15,000 tons, to Illinois Steel Co., 5000 tons to Inland Steel Co., Chicago; 27,000 tons of fastenings distributed among various producers.

Illinois Central; 10,000 tons to Illinois Steel Co., Chicago, 5000 tons to Inland Steel Co., Chicago, 5000 tons to Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

Pipe

Pipe Prices, Page 59

Pittsburgh—Bethlehem Steel Co. bid low on approximately 21,000 feet of steel pipe in various sizes from ½ to 4-inch to Pittsburgh federal engineers, March 17. The same buyers will take bids March 27 for a tonnage of extra heavy cast iron pipe flanges and pipe unions. Both of these lots of material are for the Montgomery island roller crest dam, Ohio river.

Cleveland—A few small CWA cast pipe projects have been figured for early award, including 125 tons for Youngstown, O., and 2700 feet of 8-inch for New London, O., the latter approximately 65 tons.

Chicago—Cast pipe orders are light and action is delayed on a large number of projects in this and nearby states. Milwaukee is taking bids on 800 tons of large diameter pipe. City of Chicago is inquiring for 12,000 feet of 2 and 2½-inch steel pipe.

McClintic-Marshall Corp., Bethlehem, Pa., has been awarded 9300 tons of 48, 54 and 60-inch steel pipe for a St. Louis reservoir. Contract calls for 67,895 feet. Bid was $676,277.20.

Boston—With the release of more federal loan funds for New England work, inquiry and buying of cast pipe has stepped up. More pipe will be out for the northern tier states with better trenching weather.

New York—Cast pipe purchases for CWA requirements in various parts of the state are heavier. Such purchases were recently made for Buffalo and Kingston, N. Y. The largest awarded in the east includes nearly 2800 tons for Watervliet, N. Y. Demand for line pipe is dull.

Jarcho Bros., 21 East Thirty-seventh street, New York, awarded heating contract for the new post-office here, will buy a miscellaneous tonnage of pipe.

Philadelphia—Pennsylvania railroad opens bids this week on 150 tons of cast pipe. Other pending tonnages include 210 tons for Reading, Pa.

Buffalo—The largest water pipe tonnage purchased in this vicinity in recent years will be bought if a $715,000 CWA project is approved.

Birmingham, Ala.—Quiet conditions still are noted, though a recent survey shows $202,189,000 is be-

ing sought through PWA loans for projects which will require pipe. Suit has been started in Alabama to test the ability of the state to meet requirements of the government for loans, several waterworks and sewerage propositions here being involved.

Cast Pipe Placed

2800 tons, 8 to 24-inch, Watervliet, N. Y., to United States Pipe & Foundry Co., Burlington, N. J.

600 tons, watermain extension, Charlotte, N. C., to Lynchburg Foundry Co., Lynchburg, Va.; A. H. Guion & Co., Charlotte, general contractor.

360 tons, 4 to 8-inch, class 150, Morgan Hill, Calif., to American Cast Iron Pipe Co., Birmingham, Ala.

250 tons, 6 to 12-inch, cement lined, Gloucester, Mass., to Warren Foundry & Pipe Co., Phillipsburg, N. J.

130 tons, 4 to 14-inch, class 150, Laguna Beach, Calif., to United States Pipe & Foundry Co., Burlington, N. J.

100 tons, 6-inch, Oshkosh, Wis., to Glamorgan Pipe & Foundry Co., Lynchburg, Va.

100 tons, small sizes and fittings, state hospital, Beacon, N. Y., to Donaldson Iron Works, Emaus, Pa.

Cast Pipe Pending

800 tons, mainly 12-inch, Milwaukee; bids in.

210 tons, water department, Reading, Pa.; W. S. Rae, Pittsburgh, general contractor.

205 tons, 6 and 12-inch, Northampton, Mass.; bids April 2.

150 tons, Pennsylvania railroad, Philadelphia; bids March 26.

125 tons, 6 to 12-inch, Bellingham, Mass.; bids in.

125 tons, CWA-Youngstown, O., project; bids in.

119 tons, 4-inch, class 150, Oakland, Calif.; United States Pipe & Foundry Co., Burlington, N. J., low.

100 tons, 4 and 6-inch also pump equipment, Camp Murray, Wash.; A. Scarsella, Seattle, low.

Unstated tonnage, heavy cast iron pipe flanges and pipe unions; bids March 27 to federal engineers, Pittsburgh.

Steel Pipe Placed

9300 tons, 48, 54 and 60-inch, St. Louis reservoir, to McClintic-Marshall Corp., Bethlehem, Pa., low bid $676,277.20.

Steel Pipe Pending

Unstated tonnage, 6000 feet 2-inch, 6000 feet 2½-inch standard pipe, city of Chicago; bids April 3.

Unstated tonnage, 21,000 feet of various sizes ½ to 4-inch, bids of March 17 to federal engineers, Pittsburgh; Bethlehem Steel Co., Bethlehem, Pa., low.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 59

Current buying and prospective requirements for bolts, nuts and rivets make an active market for second quarter. Continuation of prices unchanged for that period has served to steady conditions. Bolts and nuts are 70 off, small rivets 70 and 10 off, and large rivets 2.75c, Pittsburgh, and 2.85c, Chicago.

Pittsburgh makers participated in a recent award by the Pennsylvania railroad. Farm implement manufacturers are increasing their purchases at Chicago and railroads are buying more freely.

Railroad needs strengthen the market at New York. New York Central will open bids March 27 on its second quarter requirements. Stainless steel bolts will be required for the New York midtown tunnel for which Mason & Hanger, New York, have been given a contract.

Cleveland nut and bolt manufacturers report March tonnage so far approximately 10 per cent ahead of the comparable period last month. Specifications from the automotive industry have not abated, despite uncertainties of the labor situation.

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SMALL minor parts, such as the bearing cone of a roller skate wheel, often assume major importance when you count the cost of making them by the million.

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Shapes

Structural Shape Prices, Page 58

New York—Leading awards in this district, 2600 tons of shapes and miscellaneous structural steel, and 350 tons of plates, were placed last week for the Manhattan-Weehawken Hudson river tunnel, through the Mason & Hanger Co., New York, general contractor.

Pittsburgh—Led by 8000 tons of shapes and plates for a government dam at Fort Peck, Montana, structural inquiry is heavier. Low bidders have been announced on the 2900-ton Apalachicola bay bridge in Florida, and award is expected soon.

Plain structural shapes are firm at 1.70c base, Pittsburgh, but fabricated and erected prices continue irregular.

Cleveland—Except for small, miscellaneous lots required in and nearby Cleveland, fabricators here have had to depend largely on projects in western New York and Pennsylvania, and southern Ohio recently. A Cleveland general contractor awarded 200 tons for a Pittsburgh Plate Glass Co. plant addition at Clarksburg, W. Va., to a Pittsburgh fabricator; and 165 tons for a technical data building at Wright field, Dayton, also went to a Pittsburgh interest. State bridge and road work is not developing tonnage as expected.

Chicago—Bridge work still predominates in the structural shape market, although a few private projects are appearing in orders and inquiries. Illinois takes bids this week on 500 tons for several bridges, with 650 tons pending in Wisconsin. Other inquiries are headed by 5000 tons for Boulder dam power plants, and 2000 tons for an ore trestle at Escanaba, Mich.

Boston—Structural steel for state hospital PWA work, notably in Massachusetts, is beginning to be released after being held up for weeks. A heavy volume of bridge construction work also is nearing the active stage.

Philadelphia — Fabricators are figuring on slightly more work, but orders are slow. On 3000 tons for an airport building at Middletown, Pa., the Rust Engineering Co., Pittsburgh, is low for the general contract.

Contracts Placed

5540 tons, municipal auditorium, Kansas City, Mo., to Kansas Sity Structural Steel Co., Kansas City, Mo.

3975 tons, Illinois state bridge at Cairo, to American Bridge Co., Pittsburgh.

2950 tons, shafts and miscellaneous structural needs, Hudson river-Manhattan-Weehawken tunnel, New York, including 1300 tons of road beams to Carnegie Steel Co., Pittsburgh; 800 tons to American Bridge Co., Pittsburgh; and 500 tons to Federal Shipyard & Drydock Co., Kearny, N. J.; and 350 tons of plates to McClintic-Marshall Corp., Bethlehem, Pa.

2460 tons, state hospital, Pine Aire station, New York, to McClintic-Marshall Corp.; through Turner Construction Co.

1800 tons, mill buildings for Wheeling Steel Corp., Yorkville, O., to Wheeling Structural Steel Co., Wheeling, W. Va.

1500 tons, bridge, Henry, Ill., to McClintic-Marshall Corp., Bethlehem, Pa.

1000 tons, W. D. Block department store, Indianapolis, to American Bridge Co., Pittsburgh; this is in addition to 1800 tons for the building awarded to Central States Bridge & Structural Co., Indianapolis, as reported last week.

967 tons, viaduct and bridge extension, Pequannock river, Morris and Passaic counties, New Jersey, to McClintic-Marshall Corp., Bethlehem, Pa.; through Gray Construction Co.

950 tons, race track, Arcadia, Calif., to Consolidated Steel Corp., Los Angeles.

920 tons, state highway bridge, Perry county, Pennsylvania, to Lackawanna Structural Steel Corp., Buffalo.

855 tons, truss bridge, Pennsylvania state highway, route 31, Newport, Pa., to Lackawanna Steel Construction Corp., Buffalo.

825 tons, highway bridges, Illinois; 525 tons to Vincennes Bridge Co., Vincennes, Ind.; 300 tons to Illinois Steel Bridge Co., Jacksonville, Ill.

800 tons, two air corps hangars, Shreveport, La., to Austin Bros., Dallas, Tex.; James T. Taylor, Fort Worth, Tex., general contractor.

500 tons, approximate, cranes for Puget Sound navy yard, to Judson Pacific Co., San Francisco.

475 tons, municipal stadium, Syracuse, N. Y., to Syracuse Engineering Co., Syracuse; W. E. Irish Co., general contractor.

300 tons, building for Gulf Refining Co., Philadelphia, to American Fabricated Steel Co., Philadelphia.

280 tons, Maryland state highway bridge, Colora, Md., to Fort Pitt Bridge Works, Pittsburgh.

275 tons, bridges, Oklahoma, to J. B. Klein Iron & Foundry Co., Oklahoma City, Okla.

265 tons, arts and sciences building, University of Maryland, Baltimore, to Dietrich Bros., Baltimore.

250 tons, bridges, Missouri, to St. Louis Structural Steel Co., St. Louis.

250 tons, state highway bridge, Orange county, New York, to Lieder Structural Steel Co., New York; through Peter Bruno, contractor.

210 tons, power plant, state hospital, Northampton, Mass., to Haarmann Steel Co., Holyoke, Mass.; Edward J. Rappali Co., Boston, general contractor.

200 tons, plant addition for Pittsburgh Plate Glass Co., Clarksburg, W. Va., to Pittsburgh Bridge & Iron Works, Pittsburgh; through H. K. Ferguson Co., Cleveland.

195 tons, alterations to power plant, navy yard, Brooklyn, N. Y., to Norton Steel Co., New York.

190 tons, power house state hospital, Rome, N. Y., to Syracuse Engineering Co., Syracuse, N. J.; W. J. Burns, general contractor.

185 tons, factory for Rohn & Haas, Bristol, Pa., to Morris, Wheeler & Co., Philadelphia.

165 tons, technical data building, Wright Field, Dayton, O., to Pittsburgh Bridge & Iron Works, Pittsburgh.

155 tons, state highway bridge, Waynesboro, Va., to Virginia Bridge & Iron Co., Roanoke, Va.

150 tons, incinerator, Williamsburg, Va., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

140 tons, Athletic building, Saratoga Springs, N. Y., to Smith & Caffrey, Syracuse, N. Y.; through Louis Keil, contractor.

127 tons, including 18 tons of bars, state bridge, Big Cedar, Le Flore county, Oklahoma, to J. B. Klein Iron & Foundry Co., Oklahoma City; Lee Harris, Cushing, Okla., general contractor.

125 tons, state bridge, Slope county, North Dakota, to Minneapolis-Moline Power Implement Co., Minneapolis.

112 tons, overpass, Harts and Purtle creek bridges, Titus county, Texas, to Austin Bros. and Southern States Steel Co., Dallas, Tex.; Ben Sira & Co., Dallas, general contractor.

100 tons or more, mill unit, Highland Falls, Ga., to Virginia Bridge & Iron Co., Roanoke, Va.; Batson-Cook Co. Inc., West Point, Ga., general contractor. Bars to Kalman Steel Corp., Bethlehem, Pa.

100 tons, platform for Washington Iron Works, Los Angeles, to Pacific Iron & Steel Co., Los Angeles.

100 tons, shapes and bars, school, Chevy Chase, Md., to Barber & Ross Inc., and Hudson Supply & Equipment Co., Washington.

Unstated tonnage, school, Whitefield, N. H., to Bethlehem Fabricators Inc., Bethlehem, Pa.; Loucks & Clark Corp., Wallingford, Conn., general contractor. Small lot of bars to Truscon Steel Co., Youngstown, O.

Shape Awards Compared

	Tons
Week ended March 24	**26,979**
Week ended March 17	**21,533**
Week ended March 10	**13,725**
This week in 1933	**9,465**
Weekly average for 1933	**15,413**
Weekly average 1934	**17,965**
Weekly average February	**19,676**
Total to date 1933	**123,317**
Total to date 1934	**233,556**

Contracts Pending

8000 tons, shapes and plates, four tunnels and intakes, each one mile long, for dam at Fort Peck, Montana; bids to Kansas City, Mo., army engineers, April 11.

5000 tons, power plant, Boulder canyon project, specification 567; bids April 5 to bureau of reclamation, Denver. Requirements include roof trusses, girders, columns, crane rails, crane rail supports and other miscellaneous steel work to be installed by the government.

4800 tons, including 1500 tons of steel sheet piling and 2300 tons of fabricated structural steel, bridge No. 2, Philadelphia-Camden, N. J.; bids to joint bridge committee, April 5.

3000 tons, buildings at air port, Middletown, Pa.; Rust Engineering Co., Pittsburgh, low for general contract.

2900 tons, Apalachicola bay bridge, Tallahassee, Fla.; bids of March 22; Doulet & Ewin, New Orleans, low on beam spans, 2300 tons; and Nashville

Bridge Co., Nashville, Tenn., low on draw span, 600 tons.
2000 tons, ore trestle, Chicago & North Western railroad, Escanaba, Mich.
1700 tons, piling, Milwaukee filtration plant; Edward E. Gillen Co., Milwaukee, low on general contract.
800 tons, power plant, Howard university, Washington; bids March 29.
660 tons, Wilson high school, Washington; Lehigh Structural Steel Co., Allentown, Pa., reported low.
650 tons, highway bridges, Wisconsin; bids March 28.
500 tons, highway bridges, Illinois; bids March 27.
400 tons, new chemistry building, Howard university, Washington; bids March 29.
375 tons, state bridges, Virginia; bids April 3.
356 tons, piling, widening American river bridge, Sacramento, Calif.; bids opened.
350 tons, gymnasium, St. Paul.
250 tons, bridge over Santa Fe tracks, Cook county, Illinois.
230 tons, piling, drop structure, north section, El Fuste siphon, Mercedes, Tex.; Carnegie Steel Co., Pittsburgh, low.
200 tons, foundation and extension to internal revenue building, Washington.
200 tons, one plate girder span and one I-beam overhead bridge, West Elizabeth borough, Allegheny county, Pennsylvania; bids to department of highways, Harrisburg, Pa., April 6; bids of Jan. 19 rejected.
200 tons, state highway bridge, Newburyport, Mass.; bids March 27.

Reinforcing

Reinforcing Bar Prices, Page 59

Pittsburgh—The second 3000-ton inquiry from Boulder dam, on which Pittsburgh bar mills have submitted bids, finds Sheffield Steel Corp., Kansas City, Mo., again low. New inquiry includes 3500 tons for a government dam at Fort Peck, Mont., bids April 11 to Kansas City, Mo., engineers. New billet bars hold at 1.90c, base, Pittsburgh.

Cleveland—A few small industrial jobs are noted, including award of 220 tons of concrete bars for the Firestone Tire & Rubber Co.'s service station in Cleveland. Pending are 230 tons additional requirements for a culvert in Brook Park, Cleveland. Public work is slow.

Chicago—New orders are light, with fairly large tonnages pending. Illinois will take bids on about 1000 tons additional for road work. Total bar requirements in this state are estimated at around 10,000 tons for the year, of which only a small portion has been booked. Private construction work usually involves only small tonnages but there has been a slight increase in such activity recently. Prices are steady at 1.95c, Chicago, for cut lengths of billet bars, and 1.80c for rail steel.

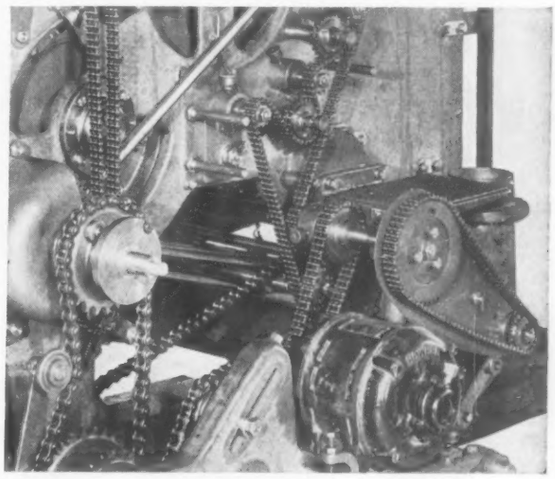
Boston—Several hundred tons of reinforcing bars were placed in New England during the week, including about 200 tons for a state hospital power house at Northampton, Mass. Prospects appear better for the purchase of bars for several public works projects which have been held up.

New York—Reinforcing steel buy-

Concrete Awards Compared

	Tons
Week ended March 24.....	4,391
Week ended March 17.....	4,483
Week ended March 10.....	5,760
This week in 1933.....	3,050
Weekly average for 1933....	3,771
Weekly average 1934.....	4,103
Weekly average, February ..	3,683
Total to date 1933.....	46,862
Total to date 1934.....	53,339

CHAIN DRIVES ENDURE



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ing has diminished following the award of several New Jersey highway projects. Fresh inquiry is coming out slowly, although a fair volume remains to be placed.

Philadelphia—Reinforcing bar inquiry is light, including 275 tons for a water development at Reading, Pa. Prices are steady.

Contracts Placed

550 tons, final section, west side elevated highway, New York, evenly divided between National Bridge Works, Long Island City, N. Y., and Joseph T. Ryerson & Sons Inc., New York.

400 tons, building, Tonawanda, N. Y., for North East Milling Co., to Kalman Steel Corp., Bethlehem, Pa.

400 tons, hospital and almshouse, Shelby county, Tennessee, to Jones & Laughlin Steel Corp., Pittsburgh; through the S. & W. Construction Co., Memphis, Tenn.

400 tons, Cincinnati interceptor sewer, to West Virginia Rail Co., Huntington, W. Va.; through Torson Construction Co., general contractor, Louisville, Ky.

382 tons, dormitories, Texas Technological college, to Anderson Iron Works, Fort Worth, Tex.; through W. S. Bellows Construction Co., Oklahoma City, Okla., general contractor.

295 tons, Dry Fork and East Fork bridges, Clay county, Texas; also Mountain creek bridge, Ellis county, to unstated fabricator; through Purvis & Bertram, Forth Worth, Tex., general contractors.

290 tons, service station for Firestone Tire & Rubber Co., Cleveland; 220 tons of concrete bars to Concrete Steel Co., New York; 70 tons of structural shapes to Fort Pitt Bridge Works, Pittsburgh.

245 tons, highway, route 23, section II, Passaic county, New Jersey, to Joseph T. Ryerson & Sons Inc., New York; through R. S. Sowerbutt, general contractor.

200 tons, buildings at Albrook Field, Canal Zone, to unnamed interest.

175 tons, power house, state hospital, Northampton, Mass., to Kalman Steel Corp., Bethlehem, Pa.; Edward J. Rappoli Co., Boston, general contractor.

150 tons, foundations to new mill building Yorkville, O., for Wheeling Steel Corp., to Wheeling Corrugating Co., Wheeling, W. Va.

150 tons, Leon creek bridge, Bexar county, Texas, to Alamo Iron Works, San Antonio, Tex.; E. L. Martin Inc., Dallas, Tex., general contractor.

138 tons, viaduct and bridge extension, Pequannock river, Morris and Passaic counties, New Jersey, to Kalman Steel Corp., Bethlehem, Pa.; through Gray Construction Co.

116 tons, two air corps hangars, Shreveport, La., to Austin Bros., Dallas, Tex.; James T. Taylor, Forth Worth, Tex., general contractor.

100 tons, parcel post building foundations, Boston, to Concrete Steel Co., New York; through C. J. Maney Co. and the New England Foundation Co., general contractors.

Contracts Pending

3500 tons, four tunnels and intakes, each one mile in length, for dam at Fort Peck, Montana; bids to Kansas City, Mo., army engineers, April 11.

3000 tons, Boulder dam project, bids of March 16; Sheffield Steel Corp.; Kansas City, Mo., low.

2900 tons, Boulder dam, Boulder City, Nev., invitation 21,306-B; bids March 16.

1500 tons, Philadelphia-Camden, N. J., bridge No. 2; bids April 5 to joint bridge committee.

1012 tons, Seattle seawall improvement; bids March 29.

975 tons, sewage disposal addition, Rochester, N. Y.; bids March 26.

600 tons, Owyhee reclamation project; bids to bureau of reclamation, Ontario, Oreg., April 5.

500 tons, pier No. 3, Fort Mason, Calif.; bids opened.

440 tons, highways and bridges, Texas; bids in March 26. Bids also close March 27 on highway, Kleberg county, Texas, taking 100 tons additional.

275 tons, water development, Reading, Pa., W. S. Rae, Pittsburgh, general contractor.

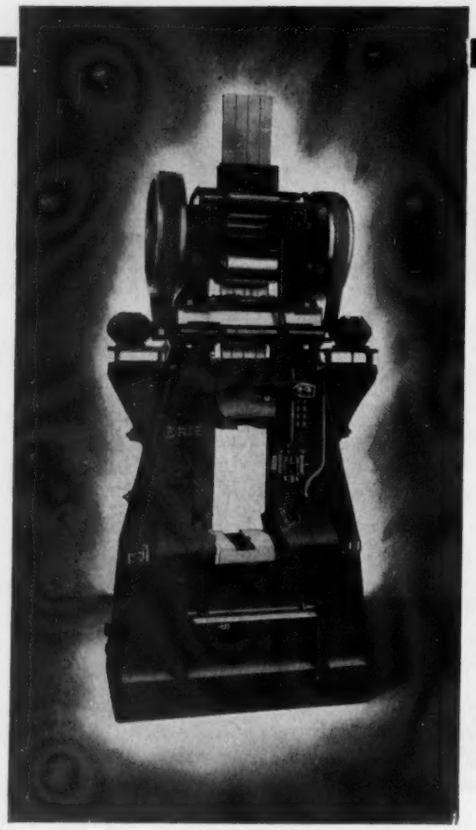
230 tons, additional requirements for culvert construction in Brook Park, Cleveland.

216 tons, widening American river bridge, Sacramento, Calif., for state; bids opened.

215 tons, state highway projects, Texas; bids in March 26.

196 tons, state highway work in four counties, Colorado; bids March 19.

Was Your Face Red?



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175 tons, state highway bridge, Newburyport, Mass.; bids in March 27 with department of public works, Boston.

170 tons, Marine View bridge, King county, Washington; bids at Seattle, April 9.

164 tons, filtration plant, Fort Peck, Mont.; bids April 6.

125 tons, highway, route 25, section 11, Adams station road to Deans, Middlesex county, New Jersey; bids April 9. Contracts also includes one 10-foot and one 16-foot span stream bridges.

110 tons, state road, Beach Haven, N. J., Edward Hollis, Westville, N. J., general contractor.

102 tons, Pennsylvania state highway work in Allegheny, Monroe and Crawford counties; bids April 6.

Unstated, four concrete piers for Douglas bridge, Alaska road commission, Juneau, Alaska; Alfred Dishaw, Juneau, low.

Unstated, main Bonneville dam; bids about May 15 to United States district engineer, Portland, Oreg.

Wire

Wire Prices, Page 59

Pittsburgh—Jobber specifications for wire products are light. No change in prices of merchant wire products has been made, with nails based on $2.35, Pittsburgh, per keg, annealed fence wire 2.35c, galvanized wire 2.70c, and galvanized barbed wire 2.85c. Plain manufacturers' wire holds at 2.20c, Pittsburgh.

Cleveland—Demand from nut and bolt and automobile manufacturers is steady, despite labor uncertainties. Consumers, however, are reluctant to place contracts for second quarter.

Chicago—Wire shipments show little change despite some betterment in movement of jobbing products to southern points. Second quarter contracting is more active at unchanged prices of $2.40 for wire nails, and 2.25c for plain wire.

Boston—Wire drawing operations and wire shipments, except for some specialties, in March are below expectations. Plain wire is firm at 2.30c, Worcester.

Philadelphia — Although jobbers are reported as having fairly good stocks of wire and wire products the general movement is considerably more free.

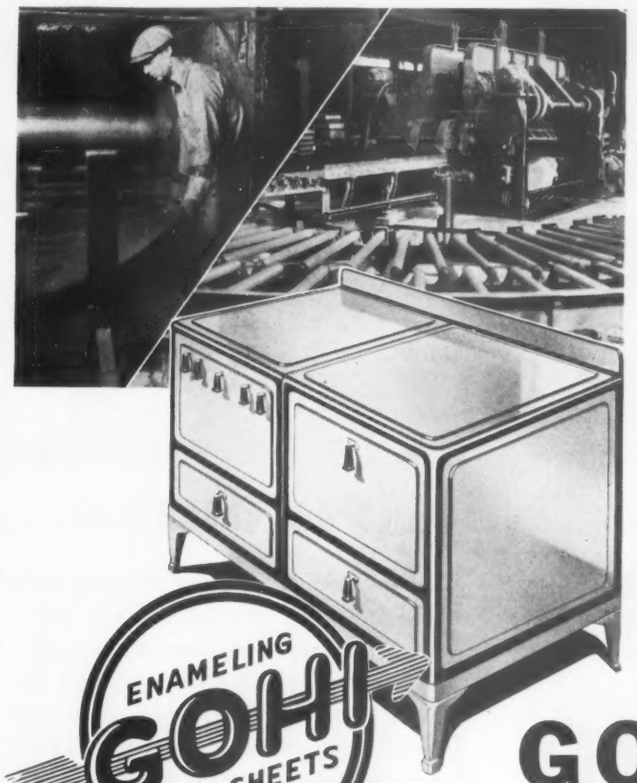
Strip Steel

Strip Prices, Page 59

Pittsburgh — Several automobile manufacturers held up shipments on strip steel specifications last week but buyers generally still specify at a fair rate. The strip market is not so active as earlier in March, but producers find difficulty in making deliveries on narrow sizes and in some stainless grades. Hot-rolled carbon strip holds at 1.75c, Pittsburgh, and cold-rolled 2.40c, Pittsburgh.

Cleveland—Strip mills will finish the month without much change in operating schedules, in completing first quarter contracts. For delivery beyond this month, however, specifications are lighter. Most of current shipments are to automobile interests. Possibility of price advances in second quarter has led some consumers to cover requirements for that period.

Chicago—Strip steel shipments to automotive interests have suffered little the past week and in instances where the movement has been lighter, the labor situation has not been held the cause. Second quarter con-



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tracting is spotty but generally slow, with prices steady.

Boston—Cold strip demand shows little improvement although producers in a few instances are buying hot strip slightly more heavily. Second quarter contracting is increasing. Cold strip is unchanged at 2.60c, Worcester.

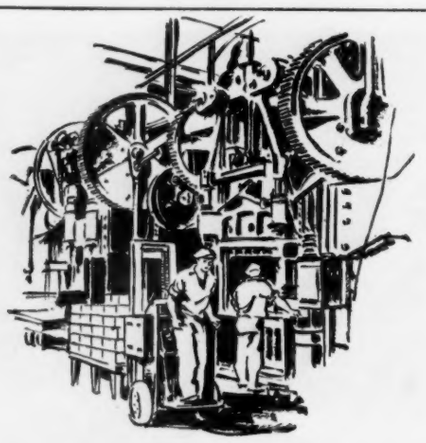
New York—The strip demand remains spotty, some sellers reporting improvement and others little gain. Prices are steady.

Tin Plate

Tin Plate Prices, Page 58

Pittsburgh—Owing to a reduction by a leading tin plate producer, the average rate of activity in the industry last week declined slightly to 75-80 per cent. Sufficient tonnage from canmakers, however, is in the market to insure at least 70 per cent operations the remainder of this month, with additional tonnage expected. Standard tin plate continues based on $5.25 per base box, with other tin mill products unchanged.

New York—Possibility of labor troubles later in the steel industry continues to spur tin plate consumers in releasing specifications. As a result, tin plate business is exceeding sellers' expectations at this time.



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Pig Iron

Pig Iron Prices, Page 60

Pittsburgh—Orders for steel and malleable castings were placed recently by the Pennsylvania railroad with seven Pittsburgh foundries. There has been little forward-buying of pig iron, however, either as a result of these casting orders or other jobbing work. Westinghouse Air Brake Co. reports having made over 15,000 sets of a new type air brake since Jan. 1, and has been fairly active in the pig iron market for small lots. Banked since mid-February, blast was again resumed last week in the Neville Island furnace of Davison Coke & Iron Co. Pig iron prices are steady.

Cleveland—Only effect unsettled labor conditions had on the pig iron market here during the week was to make consumers more reluctant to contract for second quarter. Tonnage for early delivery, however, did not suffer much, a leading merchant interest here booking 10,000 tons, practically the same as in the week preceding. Shipments continue to increase. Prices are steady.

Chicago—Buying for second quarter shipment is in encouraging volume. Malleable shops are aided by heavier orders from railroads, with needs of farm implement manufacturers substantially larger than a year ago. Shipments this month continue about 35 per cent ahead of the February rate, with additional betterment indicated for April. No early changes in prices are indicated.

Boston—Sales have gained with the closing on part of the recent inquiries in New England. Little new inquiry is noted, and prices are unchanged.

New York—Railroad releases to date have benefited local district foundries but little. Pig iron specifications in general are improved, although still far from active.

Philadelphia — Specifications are slightly better, but the general market remains sluggish, notwithstanding reports of substantially higher fuel costs next month as an added factor in pig iron prices.

Buffalo—Bethlehem Steel Co. has

changed over a blast furnace at Lackawanna, replacing one of its smaller units with a large stack, adding about 25 per cent to its production. Demand continues fairly active.

Cincinnati—Shipments this month will be heavier than in February, although purchasing for second quarter has been disappointing.

St. Louis—The market is quieter, this being attributed to uncertainties over labor. A seller of southern iron reports March business the heaviest for the month since 1929.

Birmingham, Ala.—Sales still show some activity, but purchasers are not specifying fully. Cast-iron pipe interests still are buying in limited quantities.

Toronto, Ont.—Merchant sales are holding close to the peak level for the year.

Scrap

Scrap Prices, Page 61

Pittsburgh—No. 1 heavy melting steel and other important grades have eased about 25 cents a ton and cast scrap is off 50 cents a ton. At reduced levels, however, the market is still nominal in view of a wave of shipping suspensions and withdrawals from the market which ordinarily large consumers here adopted last week. As soon as the strike threat passes possibilities are still strong that consumer scrap interest will be shown because there has been no notable decline in steel mill operations in this district.

Cleveland—Dullness prevails in the market for steel and iron scrap, though prices continue strong. Consumption has not declined but consumers are not buying under present uncertainties. Deliveries on contracts are steady.

Chicago—Scrap prices have eased with the decline in new business. Fairly active buying recently has satisfied current mill requirements and new offers are being rejected. Last sales of heavy melting steel at $12.25 represented a decline of 25 cents a ton from the top and several other grades also are off 25 to 50 cents. Old material is rather freely available, shipments having increased considerably during the recent sharp upturn.

Boston—Scrap buying has slackened, both for consumption in New England and for barge shipment. A limited volume of buying for water shipment has tended to steady heavy melting steel.

New York—Scrap buying is sluggish with most eastern domestic consumers taking light shipments, while several eastern steel mills have held up all arrivals. Recent heavy buying for water shipment to Buffalo has declined. Heavy melting prices for barge loading are unchanged.

Buffalo—There has been a complete halt in buying of scrap pending the outcome of labor difficulties. Dealers are offering tonnage at recently quoted prices but mills will not purchase. A small tonnage of No. 2 heavy melting steel is reported to have brought $12 delivered at a nearby plant. Shipments to steelworks on contracts continue without restriction.

Philadelphia—Steel and iron scrap is profoundly dull and prices are weak, with some grades reduced. No. 2 heavy melting steel, heavy breakable cast, shafting and specification pipe are off about 50 cents per ton.

Detroit—With practically all consumers and dealers out of the iron

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and steel scrap market, trading has quieted and prices continue soft. Actual declines of 50 cents a ton were recorded last week in loose sheet clippings, compressed bundles, heavy auto cast, and No. 1 machinery cast.

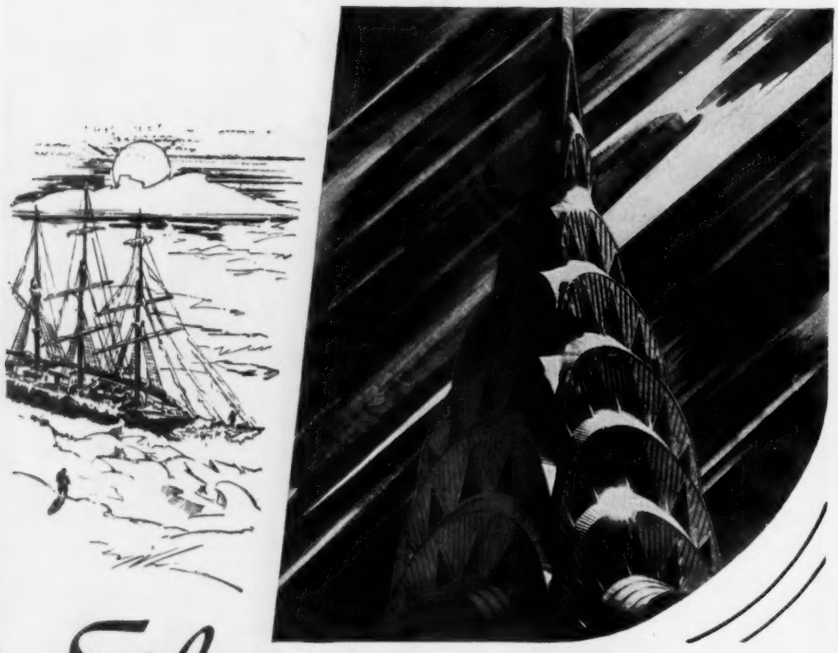
St. Louis—Following several weeks of notable strength and fair buying activity among melters and dealers, the market for iron and steel scrap has become dull, with some price reductions. The weakness was ascribed chiefly to heavier offerings of railroad and country scrap.

Cincinnati—Quotations on iron and steel scrap are unchanged. Mills are out of the market and valley deliveries are being held up. The Louisville & Nashville railroad list was withdrawn as bids were too low.

Birmingham, Ala.—Movement of steel and iron scrap are slow though one melter is asking steel shipments without restriction. Prices are steady.

Toronto, Ont.—Trading in steel and iron scrap is expanding. There is fair demand for steel grades, and open-hearth scrap is being shipped to Hamilton, Ont., melters. Foundries are taking larger tonnages. Business is well above that at the beginning of the year. Prices hold steady.

IF EXPOSURE IS A PROBLEM - -



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Warehouse

Warehouse Prices, Page 62

Pittsburgh.—An advance in wire nails out of warehouse, in prospect a week ago, has been dropped and the price continues $2.557 per keg for customers with a siding, and $2.584 for those without. Hot-rolled bars continue 2.85c, Pittsburgh warehouse, and plates and shapes, 3.05c. Out-of-town shipments are considerably heavier than city deliveries.

Cleveland—Further improvement is noted in iron and steel demand from warehouses, size of orders as well as numbers having increased during the week. An adjustment in warehouse prices of hot-rolled alloy steel bars in line with revisions recently made in other cities may be announced this week. Warehouses doing a combination warehouse and steel fabricating business have been beset by trade union organizers, and one or two shops have recognized the union.

Chicago—Sales are increasing steadily and improvement this month has been equal to expectations.

New York—Warehouse volume in March is well ahead of that of last month with most jobbers. The gains have been well spread.

Philadelphia—Expected increase in demand from steel warehouse has not appeared and the buying rate is little changed. Prices are steady.

Detroit—Despite talk of an automobile strike, warehouse demand for iron and steel was unaffected last week and held to the high level of the earlier weeks of March. This month it will show a daily average higher than February. Prices are unchanged.

Cincinnati—Warehouse tonnage continues improved over the two preceding months. Demand is diversified and sheet purchases leading.

St. Louis—Iron and steel warehouse interests report further steady expansion, the volume this month being larger than in February. As contrasted with a year ago, volume shows an increase of approximately 50 per cent.

Cold Finished

Cold Finished Prices, Page 59

Pittsburgh—Practically no forward interest has been shown by buyers of

cold-finished steel bars, due to current labor unsettlement. March specifications will at least equal February's, however. There is no change in base prices with 2.10c, the Pittsburgh base, and other markets holding at 2.15c, Cleveland, and 2.30c, Detroit.

Keystone Drawn Steel Co., Spring City, Pa., has booked 4975 feet of cold-drawn steel at 4.53c, delivered, Frankford arsenal, Philadelphia; bids March 10.

Iron Ore

Iron Ore Prices, Page 60

New York—Prospects of substantial rail buying this year have stimulated low phosphorus ore importations. Since the first of the year, according to reliable trade estimates, importations of this type of ore have exceeded 25,000 tons, a much better rate of arrival than prevailed last year.

Cleveland—Iron ore prices have not yet been determined. If reaffirmed, as expected in some quarters, this will be the sixth consecutive year they have remained at the same level. The Lake Superior Iron Ore association's current report:

	Tons
Consumed in January	1,656,303
Consumed in February	1,727,746
Increase in February	71,443
Consumed in February, 1933	634,443
On hand at furnaces March, 1, 1934	26,040,550
On Lake Erie docks March, 1, 1934	5,175,886
Total at furnaces and Lake Erie docks, March 1, 1934	31,216,436
Total March 1, 1933	30,152,106

Metallurgical Coke

Coke Prices, Page 59

Coincident with the recent reduction of standard furnace coke to $3.25 per ton, Connellsville beehive ovens, for yearly contracts only, medium sulphur furnace coke also has been reduced 25 cents a ton and is now quoted $3, Connellsville beehive ovens, for 12-month contracts. No change has occurred in foundry coke at $4.25, Connellsville ovens, for common grades, and $5 for the premium brand. The latter price, however, is subject to a 20-cent per ton deduction for eastern deliveries.

Foundry coke shipments at Chicago in addition to being the heaviest so far this year, are about 50 per cent larger than in February. The upturn is attributed entirely to better foundry schedules. Stocks have been consumed and increased schedules have necessitated a similar gain in coke receipts. The market is unchanged at $8.50, ovens, for outside delivery and $9.25, delivered Chicago.

St. Louis coke sellers find demand from foundry users active and some are giving additional orders for second quarter, first purchases being insufficient. Birmingham, Ala., ovens are being called on for larger shipments to important western users.

Semifinished

Semifinished Prices, Page 59

Billets are more active, and sheet bar demand is steady, but the market for wire rods, skelp and other semifinished steels is quiet. Sheet bars and billets continue $26, base, Pittsburgh; wire rods $36; and skelp 1.60c.

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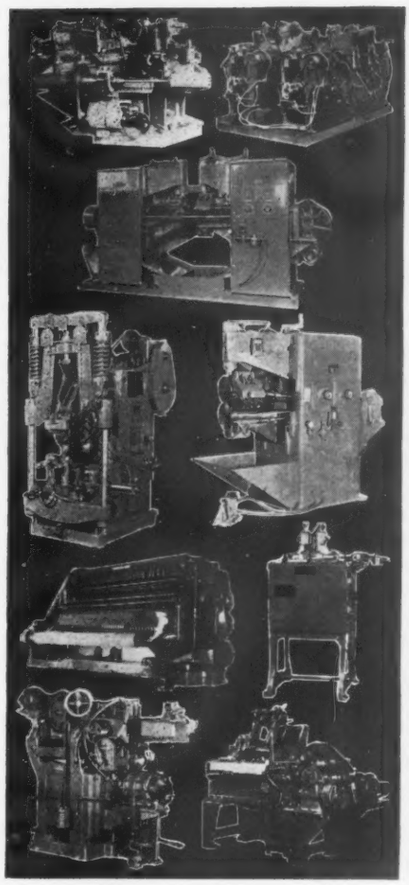

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Pacific Coast

Pacific Coast Prices, Page 59, 60, 62

San Francisco—(*By Air Mail*)—Plate and shape awards during the past week were the largest so far this year. Awards of reinforcing bars exceeded 4400 tons. Sheffield Steel Corp., Kansas City, Mo., took 3000 tons for Boulder dam. Bids also have been opened on 2900 tons additional for the same project. Pending business involves more than 13,000 tons.

Among the larger plate bookings were 3500 tons of 28-inch pipe and 500 tons of pontoon pipe for Fort Peck, Mont., taken by McClintic-Marshall Corp., Bethlehem, Pa. Redlands, Calif., placed 275 tons and 187 tons of 20 and 22-inch pipe, respectively, with Consolidated Steel Corp., and the Southern Pipe & Casing Co., both of Los Angeles. Bids have been opened on two locomotives for Mare Island, Calif., requiring 250 tons.

Consolidated Steel Corp. has booked 950 tons of shapes for a race track at Arcadia, Calif. Columbia Steel Co. booked 125 tons for a bridge at Jalama, Calif. Bids have been taken on 356 tons for sheet piling for the American river bridge, Sacramento, Calif., and on 150 tons for a bridge at Healdsburg, Calif.

Awards of cast iron pipe included 360 tons for Morgan Hill, Calif., placed with the American Cast Iron Pipe Co. and 130 tons for Laguna Beach, Calif., taken by the United States Pipe & Foundry Co. The latter company also was low on 119 tons for Oakland, Calif. The largest pending business calls for 120 tons for Beverly Hills, Calif., bids on which open March 27.

Steel Demand Gaining

Seattle—Demand for iron and steel products continues to gain. The first shipment direct to Vladivostok from this section since the recognition of Russia has just been dispatched. It included 3500 measurement tons of tin cans supplied by the American Can Co.

Major C. F. Williams, United States district engineer at Portland, Oreg., expects to call bids about May 15 for the main Bonneville dam. Plans and specifications will be ready about April 15.

The week's awards included 250 tons of plates to the Columbia Steel Co., purchased by the port of Portland for 100 steel pontoons for river dredging. King Bros., Portland, Oreg., have the contract for fabrication. Unstated plate tonnage went to San Francisco for lining a 12-foot canal and steel sheet piling for the Washington Pulp & Paper Corp., Port Angeles, Wash. Bureau of reclamation will receive bids at Ontario, Oreg., April 5, for a unit of the Owyhee project, involving 600 tons of reinforcing steel, installing 12-ton gates and concrete pipe. The same department at Stanfield, Oreg., will open bids April 3 for syphons and tunnel, 63 tons of reinforcing bars and 530 feet of 15 and 36-inch corrugated pipe.

No important structural awards were noted this week except about 500 tons for several cranes at the Puget Sound navy yard to the Judson-Pacific Co., San Francisco. Lake Washington Shipyards, Seattle, is low bidder at $50,750 for the lighthouse tender RHODODENDRON, requiring 110 tons of shapes and plates. Seattle will award 1012 tons of reinforcing steel and 100 tons of machine bolts March 29 for the seawall project. King county will receive tenders April 9 for the Marine view span taking 170 tons of concrete bars.

Wholesale warehouse volume is fairly large, buying being mainly out of stock and in small tonnages. A. Scarsella, 947 Twenty-sixth avenue South Seattle, is low at $10,959 for supplying about 100 tons of 4 and 6-inch pipe and pump equipment for Camp Murray, Wash. The scrap market is unchanged with small local turnover.

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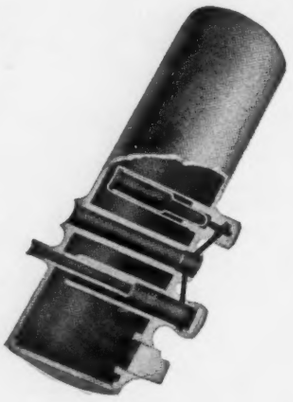

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Steel in Europe

Foreign Steel Prices, Page 62

London—(*By Cable*)—Iron and steel conditions are again more active, mainly in domestic trade, but exports are slack. The building industry has stimulated the demand for light castings. An additional blast furnace stack has been lighted in the Middlesbrough area. The finished steel market is generally stronger except for sheets. A shipment of 3000 tons of steel has been sent to Russia. China has ordered 17,000 tons of rails.

The Continent reports exports are fairly satisfactory. The International Rail Manufacturers' association has booked a substantial contract from the Argentine. Poland has booked an order for tubes for delivery to Russia. Japan is competing in the market for merchant bars.

Equipment

Pittsburgh—Although the foundation and mill building contracts for the new tin mill which Wheeling Steel Corp. is preparing to build at Yorkville, O., have been let, orders for heating furnaces and auxiliary equipment are yet to be closed upon. Last week foundations for the new mill were awarded to Rust Engineering Co., Pittsburgh. Inland Steel Co., Chicago, has placed an order for a continuous kiln for installation at its Indiana Harbor, Ind., works, with Swindell-Dressler Corp., Pittsburgh.

New York—Orders and inquiry for machinery and equipment show spotty improvement with some encouraging indications of more buying. General Electric Co. has bought additional equipment for its refrigerator department and a New York locomotive building shop is considering the purchase of some machinery. In the export field, Japan has been a fairly heavy buyer recently, although expected business from Russia has not developed materially. Eastern airplane and part builders are much more active, but these shops are generally already well equipped.

Boston—Demand for machinery and shop equipment is about holding at the current rate with New England machine tool builders. A large percentage of the varied volume originates outside New England. Textile machinery builders are still active. A fair list of tools is up for navy yard shops while Bardons & Oliver, Cleveland, have been awarded turret lathe for the Portsmouth, N. H., yard.

Chicago—Labor troubles have a slight retarding effect on equipment demand. Automotive plants are less active in purchases of miscellaneous small tools while in the Milwaukee and eastern Wisconsin districts inquiries for various types of equipment are less active and purchases are being held up. This has been particularly noticeable in foundry equipment recently. The Santa Fe railroad entered the market recently for three machine tools. Railroad equipment builders are inactive in equipment purchases. American Hoist & Derrick Co., St. Paul, at $69,192 has booked four cranes equipped with steel booms for use in connection with the construction of the General Joe Wheeler dam, Tennessee Valley Authority, above Muscle Shoals. Clyde Sales Co., Duluth, took six gantry cranes for use on the same project at $98,254.

Cleveland—Equipment buying is holding up well, with only occasional concellations being received as an outgrowth of labor difficulties. The ten-day interval between new price filing and effective date in the machinery code serves to drive in some business. Deliveries on many items are again becoming deferred, on some machine tools as long as a month being required for delivery. This indicates that stocks are being worked off. Used equipment is moving in fair volume to a diversified range of customers.

Nonferrous Metals

Nonferrous Metal Prices, Page 60, 61

New York—Demand for nonferrous metals was at low ebb last week, reflecting the uncertainty facing industry over labor disputes currently in the news.

Copper—Reconvened hearings on th ecopper code were abruptly recessed in Washington Tuesday due to continued disagreement. Closed meetings were held by H. O. King with leading producers in an effort to force the matter to an early conclusion. The government may be forced to thrust a code upon the industry, it is believed. Only occasional bookings of copper were made in the domestic market at 8.00c, Connecticut. Foreign demand continued fair. Scrap material still is being closely held.

Lead — The market continued steady despite a further increase of 8550 tons in surplus stocks in February. Lead has been proportionately the most active of the major nonferrous metals.

Zinc—Prices eased slightly with prime western for delivery through April at 4.35c, East St. Louis. High-grade sold at 1 cent over the February average price quoted on prime western.

Tin—Domestic prices moved to above the 54-cent level due to a recovery in London. Demand was for small lots.

Antimony—Spot metal eased late in the week. Little business was done.

Aluminum—Remelt grades were slow and slightly easier. Virgin was quiet. Low prices were reported for steel mill deoxidizer.

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Sales Representatives:
Chicago . Cincinnati . Cleveland . Detroit . Indianapolis
Memphis . New York . St. Louis . Washington, D. C. . Los Angeles

Coke By-Products

Coke By-Product Prices, Page 59

New York—Announcement as to second quarter prices for distillates is expected late this week. Meanwhile demand has increased, despite uncertainty in the automobile industry which would be reflected among lacquer makers. Toluol specifications are heavier, an expected price advance driving in business.

Ferroalloys

Ferroalloy Prices, Page 60

Extension of the first quarter price on ferromanganese, spiegeleisen and other ferroalloys for the second quarter, as reported last week, has had little effect on a fairly steady rate of specifying. Most buyers are now negotiating scond quarter contracts.

Quicksilver

New York—Quicksilver is quiet. Small sales were made last week at $76, a virgin flask of 76 pounds, but round lots are availablt at $75 a flask.

Labor Is Sensitive

(*Continued from Page* 13)

Care naturally is exercised to prevent known radicals with bad records from being hired, fingerprinting of new employes in some instances aiding the detection of such individuals.

PITTSBURGH

The big question mark to today's labor troubles—so far as steel is concerned—is the actual extent of unionization. Neither steel producers nor labor organizers can accurately determine the definite inroads unions have made in the ranks of mill employes. The percentage of unionization among employes is certainly not as high as 50 per cent, nor under 25 per cent.

Steel mill management fears not the actual number of its employes today that are openly union, but it is disturbed by the possible overnight consequences of a runaway to the unions, once momentum got under way through incitation, or the effects of strikes in surrounding industries. Unionization's strides might gather size like a snowball.

Here and there in the steel industry, however, are openly-conceded spots where unions have gained a firm foothold among mill employes and have been using this organization belligerently. For instance, one Pittsburgh steel mill concedes that one of its works is strongly pro-union but its other nearby divisions are strongly company-union. This former mill's union organization is centered in about 700 chippers. Another mill, having three separate divisions at Youngstown, O., says that one division is partly unionized, but that the other two divisions close by are strongly anti-union.

Still a fourth Pittsburgh steel mill, asked concerning the extent of its unionization, frankly confesses its inability to estimate. Men working for this mill who have had company union representation successfully for many years have been lately accepting American Federation of Labor invitations to get-togethers and beer parties after working hours. Foremen have not been invited.

That union organizers are putting everything they have into present efforts to unionize industry is evident by some of their methods to enroll members. For example, in the Pittsburgh district cases have come to light where nonunion steel mill employes have been solicited with offers by organizers to give them full paid initiation, plus a full paid dues card for a year's running for sums as low as 5 cents.

On the other hand, do the men themselves want unionization? It has not been recorded in the daily press that a delegation of mill men representing a company union of a large Pittsburgh steel producer went to Washington recently and made protests unsponsored by the company management, that American Federation of Labor organizers be excluded from their plant.

It is known, however, that with the exception of a few minor works where balloting was close, that employes of United States Steel Corp. subsidiary plants voted just a month ago for changes in the company employes representation plan. In so doing, they further ratified the company union.

A strong argument that steel mill management has had to combat inroads of professional labor organizers is the help given unemployed mill men through housing, clothing and food through recent periods of slack employment.

Although there are only four Amalgamated Association of Iron, Steel and Tin Workers' chapters in Pittsburgh mills, this union, with headquarters in Pittsburgh claimed to STEEL last week that it had 124 chapters over the country. The association claims furthermore that in the last eight months it has organized 135 new local chapters of affiliated unions over the country, claiming approximately 100,000 members.

CLEVELAND

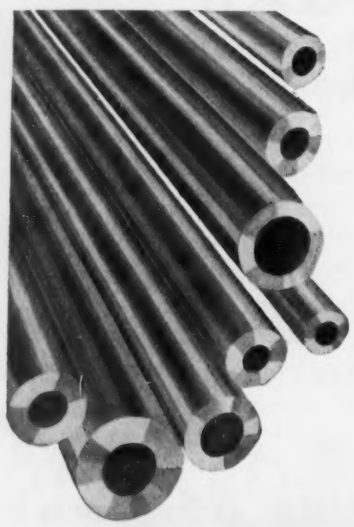
Except for the building trades, Cleveland before NRA was established, was virtually open shop. With droves of organizers in the city telling the workers "the government is with us," considerable headway has been made in unionizing industries.

Approximately 20,000 men are engaged directly in iron and steel manufacture in Cleveland, and as near as can be determined through many inquiries, about 10 per cent now hold union membership. The Amalgamated association apparently has been concentrating its efforts on the Otis Steel Co., but demand for union recognition was not formally presented last week.

Twenty per cent of foundry employes; 20 to 25 per cent of machine tool plant workers; 20 per cent of automobile body and parts employes; and 10 per cent of forge shop employes are now estimated union members.

Efforts were directed toward iron and steel warehouses, but so far progress has been made chiefly with those which do a combination warehouse and steel fabricating business. One of these shops is 80 per cent organized—as determined by the management in conference with the men and organizers.

Truck drivers working for ware-



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houses have been approached, and threatened with violence if they did not sign up. Another metal fabricating plant has consented to deal with the union; but the largest warehouse interests in Cleveland are taking a firm stand against recognition.

It is significant that in many instances the approach to the workers has been with promises of shorter hours and higher wages, but where the organizers have been able to get interviews with the managers they have claimed that they seek only union recognition. This has broken the resistance of some employers. Certain machine tool plants that have employed generations of workers from the same families, and never before had any labor trouble, have run afoul professional organizers. Nut and bolt manufacturers have not been immune to the "union drive." A Birmingham plant of a Cleveland nut and bolt company has been organized 100 per cent.

Many companies carried employes on payrolls through the darkest period of the depression, and have cooperated with NRA. The Washington administration is stirring up a storm of resentment now by seeming to lean toward the trade union organizers.

The union received a repulse at the plant of the Cleveland Twist Drill Co., when a vote last week showed 279 for and 139 against the employe representation plan, despite organizers' efforts to install a union. The regional labor board was threatening to step in and conduct elections in several other metalworking plants.

There are no less than five classes of labor organizations in Cleveland. First there is the A. F. of L.; then the so-called federal, or vertical, unions; the Mechanics Educational Society of America, reported as opposed to the A. F. of L.; the communists, and the I.W.W.'s. The Mechanics Educational society had only 300 or 400 members in Cleveland up to a few weeks ago, since which its membership has been increased to at least 3000.

EASTERN PENNSYLVANIA

American Federation of Labor has not permeated to any marked degree in the ranks of labor at eastern iron and steel plants. Leading producers profess no knowledge as to the exact number of employes enrolled in American Federation of Labor, studiously making it a policy in some cases of not investigating the affiliations of their men.

However, an independent survey indicates that while certain producing units connected with large organizations are more affected by outside union agitation, those of the smaller companies have not experienced a deflection of over 10 per cent on the average, and at certain plants little, if any, federation influence is apparent.

At plants of larger organizations there appears a higher but far from dominating percentage. At one of two eastern units of a large producer where employe elections were recently held, voting opposed company unions, while at the other but 13 per cent registered opposition and in these cases it appears safe to assume that minority groups are not comprised solely of federation sympathizers, although no definite figures are available.

In some other branches of the metalworking industry the American Federation of Labor appears to be making headway. This is particularly true in two or three eastern Pennsylvania cities, one of which long has been a stronghold of unionism. Whether expansion in these branches will spread to steel remains in question, depending much upon developments at Washington.

Men of Industry

(*Concluded from Page 21*)

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has opened an engineering consulting service specializing in industrial and building problems.

□ □ □

P. J. Hopkins, associated with the Cleveland Punch & Shear Works Co., Cleveland, from 1910 until 1927 when he left to engage in business for himself, has returned to the company in a sales capacity.

□ □ □

Charles B. Foster assistant sales manager of excavators for the Harnischfeger Corp., Milwakee, has been appointed sales manager of the entire P & H line of full-revolving excavators, trenchers, backfillers and pipeline equipment.

□ □ □

Carl S. Holden, vice president and sales manager of the Cleveland Welding Co., Cleveland, affiliate of the Motor Wheel Corp., Lansing, Mich., has been named vice president and sales director of the latter organization.

□ □ □

B. F. Bilsland has been appointed manager of the Chicago district office of the Allis-Chalmers Mfg. Co., Milwaukee, located at 20 North Wacker drive.

Arch J. Cooper has been named assistant manager of the New York district office, 50 Church street, A. F. Rolf is district manager there.

□ □ □

David H. Cohen, D. H. Cohen Inc., St. Louis, has been elected president of the St. Louis chapter of the Institute of Scrap Iron and Steel. Ben P. Williams, Hickman, Williams & Co., retiring president, is now chairman of the board. Other new officers include: Vice Presidents, J. L. Foerster, Standard Steel & Rail Co.; Gus Gillerman, Gus Gillerman Iron & Metal Co.; and C. C. Cohen, I. J. Cohen & Son, Kansas City, Mo.; secretary, Fred S. Fuld, Harry Benjamin Equipment Co.; treasurer, I. Bierman, F. Bierman & Sons Metal & Rubber Co.

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Construction and Enterprise

New England

BOSTON—T. D. Specialties Corp. has been organized to manufacture valves and specialties, by Thomas P. McDermott and associates, 37 Ware street, Lowell, Mass.

New York

BROOKLYN, N. Y.—King's Blade Co. Inc. has been formed by Joseph Entel, 353 Stone avenue, and associates to manufacture razor blades and other metal products.

COCHECTON, N. Y.—New York State Electric & Gas Co., Ithaca, N. Y., plans an electric power plant and distributing system here and in Sullivan county, to cost $28,000.

COLLEGE POINT, L. I., N. Y.—Fang Grip Corp. has been organized by Louis Clarke and associates, 11950 Sixth avenue, to manufacture a line of metal specialties.

ELMIRA, N. Y.—John D. Ward Foundry Co. has leased a new plant and has resumed production here, its former plant having been damaged by fire recently.

ELMIRA, N. Y.—The general foundry business which recently was organized and began operation in a large plant on College avenue has been incorporated as the Utilities Foundry Corp., with capital of $120,000.

FULTON, N. Y.—Walter L. Bradley, contractor, has been awarded contract for a 2-story, 80 x 80-foot addition to the plant of the Kohler Swiss Chocolate Co. in that city. Steel construction will be used.

HOLLAND, N. Y.—Water commissioners of district No. 1, J. Kirby chairman, plan a complete waterworks system, including 200,000-gallon elevated tank, pumps and equipment. Nussbaumer & Clark Inc., 33 South Division street, Buffalo, N. Y., are engineers.

OSWEGO, N. Y.—A company is being formed by Stewart F. Hancock and John Wilkinson, Hills building, Syracuse, N. Y., for the purpose of purchasing the plant and business of Ames Iron Works, Oswego, and placing it in operation.

SYRACUSE, N. Y.—Sanitary Metal Cap Corp. has been organized to manufacture metal seals and caps, by D. W. McPike, 764 Roberts avenue, Syracuse, N. Y.

New Jersey

JERSEY CITY, N. J.—Kingston-Conley Electric Co. has been formed by Frederick S. Kingston and Brooks L. Conley, with $100,000 capital, to manufacture electric supplies and equipment. Edwin F. Smith, 1 Exchange place, is company representative.

SOMERVILLE, N. J.—Singer Mfg. Co., 149 Broadway, New York, plans an industrial development on a 289-acre tract here.

Pennsylvania

SPRING CITY, PA.—Spring City Foundry Co. was recently damaged by fire at an estimated loss of $125,000.

Ohio

AKRON, O.—Viking Mfg. Co. has been incorporated by C. R. Foust, W. E. Holden and Olga Stayshich, to manufacture oil heating equipment.

LEETONIA, O.—Leetonia Tool Co. is making plans for expansion of its plant, following recent purchase of additional ground space. The company manufactures mining tools and demand has taxed present facilities.

YOUNGSTOWN, O.—Truscon Steel Co. has booked orders amounting to more than $100,000 for construction materials, including casement windows and steel roofing.

Michigan

DETROIT—Wayne Products & Brewing Co., 3603 East Hancock street, plans to install new brewing equipment to take care of continued expansion.

DETROIT—Chevrolet Motor Co. is planning to build additions to its gear and axle plant on Holbrook avenue. Albert Kahn Inc., 1004 Marquette building, is architect.

DETROIT—Michigan Die Casting Co. has been incorporated with 2500 shares of no par value, to deal in die casting machinery, by Louis W. Blauman, 8550 LaSalle boulevard.

DETROIT—Tom Moore Distillery Co. has been incorporated with $500,000 capital to operate a distillery, by Louis J. Newman, 924 First National Bank building, and Harry A. Tuer, 1750 New Penobscot building.

HASTINGS, MICH.—City is planning construction of new lighting plant to cost approximately $60,000.

KALAMAZOO, MICH.—E. Clark, city engineer, is completing plans for construction of pumping plant and flood control system, to cost $250,000, for which PWA funds have been granted. He is also completing plans for a $400,000 sewage disposal plant which will be financed with PWA funds.

PLYMOUTH, MICH.—Lee Foundry & Machine Co. recently was damaged by fire at an estimated loss of $100,000.

PONTIAC, MICH.—Pontiac Casting Co. has been organized by Amas Kelly to operate as a general foundry. The plant, formerly occupied by the Brisco Device Co., will be renovated and new equipment installed.

PONTIAC, MICH.—Barkeley-Mattson Corp., a small parts and specialty manufacturing concern, has transferred its operations from Detroit to Pontiac. The company will begin operations shortly in a plant on Jackson street. G. W. Barkeley, is president.

SAGINAW, MICH.—Francis Engineering Co. has completed survey for construction of a power plant at Vicksburg, Mich.

STURGIS, MICH.—Lewis M. Rishel, Holland, Mich., has purchased a factory here and will manufacture electrically-operated hot air furnaces.

TRENTON, MICH.—Trenton Valley Distillery Co., care G. F. Diehl, 120 Madison avenue, Detroit, plans a 2-story distillery 75 x 150 feet, to cost $75,000.

Indiana

INDIANAPOLIS—Ace Manufacturing Co. Inc., 560 Elder avenue, has been incorporated to manufacture machinery and mechanical devices, by Carl F. Mil-

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lican, Grover Burkholder and D. C. Humphrey.

RICHMOND, IND.—Richmond Turbine Pump Co. Inc., 800 South Seventh street, has been formed to manufacture pumping machinery and other mechanical equipment, by Walter G. Weidner and Newton W. Long.

TERRE HAUTE, IND.—Commercial Solvents Corp. 385 Flatbush avenue extension, Brooklyn, N. Y., is planning extensions to its plant at Terre Haute and a new distilling unit, at cost of more than $70,000.

Illinois

CHICAGO — Arcole Construction Co., Church street, has taken out a permit for construction of a one-story plant at 2555 South Ashland avenue, to cost about $4200.

CHICAGO—Thermals Control Corp., 565 West Washington boulevard, has been incorporated with 1000 shares to manufacture heat regulators and other devices, by Samuel J. Baskin and Eugene A. Delson.

CHICAGO—Home Gas Industries Inc., 6533 Sheridan road, has been incorporated by Chester N. Goltra, George McDonough and John N. Goltra, to deal in heating, air conditioning, insulation and refrigeration equipment.

CHICAGO—Garbe Iron Works Inc., 4155 Clark street, has been incorporated with 1500 shares to deal in iron steel and metal products, by Frank B. Garbe, Ralph J. Garbe and C. M. Shogran. Correspondent: George R. Warner, 8 Fox street, Aurora, Ill.

CHICAGO—General American Tank Car Corp., 122 East Forty-second street, New York, plans alterations and additions to its repair shop at Packers avenue and West Forty-first street. Cost estimates at $500,000, with equipment.

CHICAGO — Chicago Ornamental Iron Co., 7810 Addison street, has been incorporated to manufacture, ornamental, structural and miscellaneous iron and steel work, by S. J. Lorenz, S. T. Lorenz and Frank Lorenz. Correspondent: Adams and Emerson, Harris Trust building.

CHICAGO—Drott Peterson Construction Co., 3530 Southport avenue, has been incorporated to manufacture and deal in building material, equipment and supplies, by George Drott, John W. Peterson, and Holland F. Flahavhan. Correspondent: Holland F. Flahavhan, 69 West Washington street.

CHICAGO—Machinery & Electric Motors Corp., 1132 West Lake street, has been incorporated to deal in new and used machinery, mill products and items pertaining to equipment and parts, by Bertha Grave, Charles Goldstein and Maurice Goldstein. Correspondent: Richard A. Bell, 118 South Clinton street.

CHICAGO—Archer Iron Works Inc., 2438 West Thirty-fourth place, has been incorporated with 1000 shares par value common to manufacture building construction appliances and to deal in structural constructions, by A. T. Scannell, F. M. Scannell and Joseph N. Kush. Correspondent: Edward R. Newmann, Suite 1305-11, 120 South LaSalle street.

LANARK, ILL.—Fuhremann Canning Co., Appleton, Wis., has let contract to Oscar Boldt Construction Co., 217 South Badger avenue, Appleton, Wis., for extensions to its branch at Lanark, Ill., including steam powerhouse, materials handling equipment and hoists. Cost is estimated at $45,000. A. J. Hamilton, Appleton, is superintendent.

NIANTIC, ILL.—Wonder Heater Co., care V. O. Jones, Niantic, Ill., recently formed to manufacture heating stoves and hot water equipment, has plans completed for operation of a local plant, contingent on raising a fund of $250,000.

PARIS, ILL.—Stewart Hog Ring Co. Inc., 211 East Union street, has been incorporated with 100 shares capital stock to engage in the manufacture of metal products, by Vernon D. Stewart and associates.

Georgia

REIDSVILLE, GA.—Tucker & Howell, architects, Rhodes-Haverty building, Atlanta, will shortly begin work on plans for Georgia state prison farm which will include power, water and disposal plants, refrigeration and kitchen. Robert S. Fiske, consulting engineer, and Newcomb & Body, mechanical and electrical engineers, are located in the Walton building, Atlanta.

Maryland

BALTIMORE — Consolidated Gas, Electric Light & Power Co. has let contract for equipment for Loudon Park substation to cost approximately $1,000,000, including cables, auxiliary equipment and buildings. Contracts were placed with General Electric Co., Schenectady, N. Y., and Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., for transformer equipment.

CUMBERLAND, MD.—Burns & McDonnell Engineering Co., 107 West Linwood, Kansas City, Mo., has been engaged by city to make survey and estimate cost of construction and operation of municipal power plant.

North Carolina

GASTONIA, N. C.—Gossett Machine Works Inc. has been incorporated with capital of $40,000 by B. W. Gossett and May E. Bolin.

MARION, N. C.—Elizabeth James

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AIR COMPRESSOR—3000 Cu. Ft. 100 lb. pressure, Plate Valve. Cylinder sizes 32" & 19" x 24". Direct driven motor on shaft, 600 HP, 3 ph., 60 cy. G.E. Synchronous. Belted Exciter. Complete operating panelboard. Latest type.
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No. 6-1/2 BLISS Straight Side, Double Crank with spring counterbalance. Belt drive. 54" between housings. 8" stroke.
SHEAR—No. 10 BUFFALO for bars and shapes. Cap. up to 3-7/8" rounds and corresponding duty in other shapes. Direct connected AC MD with motor.
TESTING MACHINE—50,000 lb. RIEHLE Univ. MD. Rebuilt by manufacturers and guaranteed for accuracy.
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Hosiery Mills is planning to expand its production and will install new equipment, including automatic knitting machines.

Tennessee

CHATTANOOGA, TENN. — Columbian Iron Works, R. R. Harris secretary, Chestnut street, will build a 2-story addition to its plant, to cost $40,000. W. H. Sears, James building, is architect.

KNOXVILLE, TENN.—Tennessee valley authority, New Sprankle building, has placed orders totaling $295,693 for purchase of four steel barges from Ingalls Iron Works, Birmingham, Ala.; for bins, conveyors, batcher and tanks from Blaw-Knox Co., Pittsburgh; for two cement pumps from Fuller Co., Catasauqua, Pa.; for four tilting concrete mixers from Norris K. Davis, San Francisco; for four cranes equipped with steel booms from American Hoist & Derrick Co., St. Paul, Minn.; for six cranes with gantries from Clyde Sales Co., Duluth, Minn., in connection with construction of dam on Tennessee river above Muscle Shoals.

MEMPHIS, TENN.—Watson Pump & Supply Co. has been incorporated with capital of $20,000 by H. A. Watson and R. B. Watson.

West Virginia

RIVESVILLE, W. VA.—City, R. Paul Hood, recorder, is planning $10,000 water works extension and will build storage tank of 150,000-gallon capacity. H. L. Scott, Fairmont, W. Va. is engineer.

Virginia

FORT MONROE, VA.—Constructing quartermaster, Langley field, will open bids April 2 for installation of air conditioning system in coast artillery board building.

PULASKI, VA.—Paul Knitting Mills Inc. is planning to install 20 automatic knitting machines at an approximate cost of $25,000, and also 10 additional 300-needle knitting machines.

Missouri

DEEPWATER, MO. — William S. Scott, mayor, has made application for PWA loan and grant of $57,000 for water works and $27,500 for sewer system. E. T. Archer & Co., Kansas City, Mo., is engineer.

ST. CHARLES, MO.—St. Mary's Oil Engine Co. has been formed to manufacture oil-operated engines and parts, by J. A. Anderson, St. Charles, Mo.

ST. LOUIS—Lynn Barnes, Tulsa, Okla., and associates, have purchased from St. Louis Brewing association the Klausmann Brewery at South Broadway and Lorenz streets, for a Chicago and Oklahoma capitalist, who plans investing $2,000,000 in the plant and for rehabilitation. Kendall Creecy, 2719 Tamm, St. Louis, has drawn plans for improvements and will be consulting engineer for the operating company.

Texas

GALVESTON, TEX.—High Grade Packing Co., Sixty-fifth and J streets, has let contract to J. W. Zempter & Co., 2115 F street, for building to contain power plant, costing about $25,000, and a 2-story building for refrigeration purposes, costing about $40,000. Additional ice machinery will be installed.

RICHMOND, TEX.—City plans a waterworks system to cost $30,000. W. J. Powell, Republic National Bank building, Dallas, Tex., is consulting engineer.

Wisconsin

GREEN BAY, WIS.—Cutler-Hammer Inc. is low bidder on switch gear equipment for an extension to the metropolitan sewage plant, at $9080. General Electric Co., Schenectady, N. Y., is low on control equipment at $4087.

MADISON, WIS.—Reliance Refrigerator Machine Co., Chicago, is low bidder for furnishing humidity control equipment for the United States forest products laboratory here, at $10,415.

MILWAUKEE — Metal Spraying Corp. has been organized by Herbert S. Johnson, Raymond A. Young and Floyd E. Jenkins, 152 West Wisconsin avenue.

OCONTO, WIS.—Oconto Brewing Co. will start work about April 15 on plant improvements to cost about $50,000. W. C. Weeks, Sheboygan, Wis., is architect.

SOUTH MILWAUKEE, WIS.—Bucyrus-Erie Co. has received a government contract valued at $178,000 for 20 dredge pumps for the federal dam project at Ft. Peck, Mont.

Kansas

TOPEKA, KANS. — Capital Iron Works, Harry K. Brooks, president, has signed a contract with the Betz Unit Air Cooler Co., Kansas City, Mo., to manufacture all its products for the territory between the Mississippi river and Rocky mountains. The shop will be put in shape by adding extra equipment necessary to manufacture the coolers.

Arizona

TUSCON, ARIZ.—An election will be held April 3 on approval of expenditure of $250,000 for waterworks improvements, including 250,000-gallon steel tank on tower.

Pacific Coast

BURBANK, CALIF.—Three G Distillery, Dan Greenberg, president, 5335 Melrose avenue, Los Angeles, has let contract to Bernard Lindbergh, 8636 Olympic boulevard, Los Angeles, for erection of a distillery building and tower at 3112 West San Fernando road. A blending plant is also being erected.

SAN JOSE, CALIF.—San Jose Steel Co. has been incorporated with 500 shares of no par value, by Albert A. Fontaine, Joseph C. Lumello, San Jose, Calif., and George L. Honore Jr., Mountain View, Calif.

STOCKTON, CALIF.—Dunlievy Distilling Corp., San Diego, Calif., plans erection of a distillery to cost $300,000.

STOCKTON, CALIF.—City has voted $900,000 worth of bonds to finance construction of additional port facilities, including an 1850-foot wharf, transit shed and extensions of railroad spur tracks.

SEATTLE—Pioneer Machine Sales Corp. has been formed by C. R. Galich, 1324 Alaska building.

SEATTLE—H. I. Keisler Co. Inc., 928 First avenue, south, has been incorporated with capital of $7500 to engage in a general machinery business.

SEATTLE—Northern Pacific will expend $250,000 in enlarging and improving roundhouses at Seattle, Missoula, Mont., and Jamestown, N. Dak. Bridges on the main line will also be strengthened to accommodate the ten larger and heavier locomotives now under construction.

New Trade Publications

CUTTING TOOLS—Goddard & Goddard, Detroit, manufacturers of milling cutters, have issued catalog D on their various cutters, in looseleaf form, with marginal index.

TEMPERATURE CUTOUT — Hevi Duty Electric Co., Milwaukee, in bulletin HD-1133 describes its excess temperature cutout for protection of all types of heating equipment.

CIRCUIT BREAKERS — General Electric Co., Schenectady, N. Y., has issued bulletin No. 1822 describing its oil blast circuit breaker for steel mill motor starting and jogging service, built especially sturdily for hard work. Its bulletin No. 704D describes indoor oil circuit breakers of two types, for use on moderate capacity systems.

REGULATORS—Hagan Corp., Pittsburgh, has issued its bulletins DR 20 to 27, inclusive, devoted to master regulators, balanced float regulators, impulse amplification and remote control systems, master sender, receiving regulator, compensating relay, control panel and float sender. These devices are designed for use in industrial installations.

CAPACITORS—Ideal Electric & Mfg. Co., Mansfield, O., in bulletin 710 describes its box and rack types of capacitors for power factor correction. The bulletin gives a description of the power factor and how the capacitor acts to correct low factor. Tables are given to determine the proper size capacitator for any application.

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